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Spacious new portion of Atlantic City's convention center is seen during one of the first exhibitions held there. The facility will hold an estimated 30,000 attendees at next week's Spring Joint Computer Conference, which starts Tuesday. Entire exhibit area will be on Boardwalk level for the first time since the "joins" became the major computer attraction in the nation.

Varied Sessions at Spring Joint Expand Social, Business Themes

By a CW Staff Writer

ATLANTIC CITY, N.J. — There are several new and next week's Spring Joint Computer Conference is expected to be one of the most successful ever, but none of these reasons seems to come from the exhibit floor. Many people in the computer community have a concern and that belief will be put to a test when the show opens its three-day stint Tuesday morning in the newly expanded Convention Hall.

The conference theme, "Responsibility," will be reflected in such technical sessions as those devoted to ecology, law enforcement and responsible government. The general economy, business environment and state of the art will also be included in

these sessions.

Some of the top names in the computer community will participate in these technical portions, although they will not be on the

SJCC Coverage Begins on Page 27

exhibit floor. Even so, the conference sponsors are predicting a marked upturn in attendance from last year's 30,000.

The number of exhibitors has decreased from last year's 300 to 188, with booth space going from 900 to about 625, according to the sponsors, the American Federation of Information Processing Societies (Aips).

Major manufacturers, who opted for other shows for their equipment include IBM,

Honeywell, Unisys and Control Data Corp.

Sperry and NCR will be there, but won't be showing DP equipment. RCA will demonstrate the RCA 3 operating in a "simulated remote computing environment." The company has about 100 companies which normally buy in huge lots, the average booth size has not decreased.

(Continued on Page 2)

'Wired City' by 1975, Developer Predicts

By Edward J. Bride
CW Staff Writer

SEKONDA, N.H. — The principles of shared software, distributed data processing, CAVT and computer-assisted instruction will combine to form the "wired city" by 1975, according to Robert F. Smythe, in a report from a recent conference here.

Two Univac experts on the speakers' platform agreed with a Sanders' Associates official on the likelihood of a wired city, but indicated it wouldn't occur until 1980.

The technology is already available, according to Robert F. Smythe, a wired-city proponent and a top spokesman for Sanders Associates of Nashua, N.H.

He told a meeting of the Association for Systems Management that the "nation one day will be all cabled, [giving] access to knowledge and computing power for everyone who can afford a TV set."

Univac's Dr. Carl Hammer said it might take government money to underwrite such a project, and that the company had looked at some of the ways. "It's not a question of cost," he said. "It's a question of time. It's a 20-year ago, without performing any cost/performance evaluations.

Smythe stated cheap \$1,500 programmable CRT terminals

are in the foreseeable future, "given the economics of mass production."

Communication Solutions

Education in the home, by using a standard telephone and direct Touch-Tone telephone, is a logical extension, once "the problem of communications" is solved. He also had some ideas on solving those problems.

The second pair switched cables in TAT 12, which means for digital transmissions, Smythe explained, adding his research found microwave and other over-the-air techniques severely associated with providers. As a result, he said, "we have to go to the environment."

The coaxial cable amounts to "a beautiful digital pipe," he announced, which theoretically could move data at the rate of 13 million bits per second, per half-video channel.

He further explained that, while the practical figures are lower, CAVT cable can be installed at \$5,000 to \$6,000 per mile, with the available bandwidth from 60 to 60,000 three kilocycle channels.

What this portends is a "major impact on not only educational users, but to EDU users everywhere," Smythe declared.

(Continued on Page 2)

Bankers' Show Told

Businesses Not Security-Conscious

By Edward J. Bride
CW Staff Writer

NEW YORK — The destruction of computer systems at one time could put a business out of business permanently, but few companies realize this or are taking steps to mitigate the effects of such an occurrence, security sources report.

The 3270 is available either as a controller or as a controller system with a built-in 3270 terminal that can be attached to a 360 or 370 multiplexer or operator channel either directly or via telephone line.

The terminals are available with either 480 or 1,920 character display capacities, with the latter offering twice the capacity of previous IBM alphanumeric displays. All system components are previous.

These terminals are offered, up to 12 special keys can perform programmed functions, and a light pen is optional. Serial printers, at 40 and 66 char/sec, can be included. The 3270 operates in binary synchronous mode.

The monthly rental for a system including twelve 1,920-character stations and control will be \$1,900, with a price of \$1,000 per terminal.

The stand-alone display, including built-in controller, has a rental price of \$125 for the 480 and \$160 for the 1,920 character models. Prices are \$6,100 and \$7,100. Rental prices for the 40 char/sec printer will be \$140/mo. Shipments are scheduled for second quarter 1972.

ence, "Managing Change," was approached from many angles, and the social changes which come with civil violence were but one of these angles.

By embracing too much change "all at once," IBM caused a "painful experience for us and our customers," during the transition to System 360, an IBM executive admitted.

George Beitzel, vice-president and general manager of IBM's Data Processing Group, said the manufacturer suffered "a loss in customer satisfaction" by unexpected programming problems and delivery delays.

The plan, he said, was that by embracing too much change we couldn't keep our word," he told the keynote audience.

The lesson, Beitzel remarked, is that "even though you consider yourself in the business of change, there is still a strong resistance to change. The stronger the change you are going through, to underestimate the strong thrust of technology, the power of an idea whose time has come."

Regarding the future of computer usage, he noted the "biggest question" of whether major businesses will use computers. "The only question is how computers will be used," he remarked.

He predicted that by the end of the decade, computers will interact directly with the banks' computers in "all routine transactions," and that a "major breakthrough" will occur when

(Continued on Page 2)

On the Inside

Squad Car Terminal Speeds Communications

— Page 5

Core Memory Seen Outstanding Semi

— Page 49

Communications22
Computer Industry49
Education14
Financial54
Societies17
Software/Services19
Systems/Peripherals23

Business Called Disaster-Prone

(Continued from Page 1)
cash-dispensing machines go online.

Predictions were generally bleak regarding another social change, the "checkless society," although it appears that automation will aid in reducing much paperwork for the banking community, including the elimination of some checks.

The ABA Monetary and Payments System (Maps) planning committee released the findings of a three-year study, concluding

paper checks will continue to serve as a basic method of payments transfer.

There are nonetheless "compelling" reasons for the use of an automated method to implement the paper check system." The key to banking's success in addressing future markets is the "early identification of customer needs and wants," it stated.

One result of a computerized payments system would be a significant reduction of the necessary "float," the amount of funds in transit between banks and their customers. The Maps committee anticipated this would have relatively little impact on the total credit available from the banking system.

There is considerable user interest in NCR's banking terminals, and Burroughs, which had by far the largest bank, also emphasized its "total commitment to banking."

Not only have five companies established voice response units, but the success of this technology was evidenced by two separate television stations, which produce special segments for Monday evening news shows, heralding the arrival of the voice response feature.

One speaker predicted the use of COM would become the banking industry's "cash register," which may not be difficult to achieve since only about 120 banks use the technique now.

Edward Forrest, of Seaco Computer Display, Inc., said retrieval of a CRT system can cost \$10,000 to \$15,000, but a terminal with a \$1,000 monthly renewal term can give "real-enough-time" information, without the problems of power brownouts.

Boston Attorney Roy N. Freed told the users that, in drafting computer contracts, their language should be "neither computer nor legalise," which can confuse and "stifle the understanding of a judge, if not all others."

Bradford Security Systems, Inc., at its conference here last week, Jacobson elicited the following descending order of occurrence for computer troubles:

Human Error; power failures and brownouts; hardware failure; flooding; civil disorder and fire.

Harold Weiss, director of the Automation Training Center, added "conversion fiascos" as the major source of long-range difficulties. He noted the human error or power problems usually are not as costly as conversion troubles.

Richard P. Cooley, chairman of

the Maps committee and president of the Wells Fargo Bank in San Francisco, urged his colleagues to plan now "for an automated method to implement the paper check system."

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★ Notice to Subscribers ★

Over the past few weeks Computerworld has been experiencing delivery problems in major metropolitan areas throughout the country.

Until the advent of Amtrak May 1, CW relied heavily on passenger train mail dispatch for more than 80% of subscription copies. This service has been virtually abolished. In its place, Amtrak offers a freight service to the West Coast and special piggy-back service to the East.

The new rail service has forced major systems adjustments on CW's circulation and distribution departments, as well as on the U.S. Post Office. This conversion probably will continue to cause delays in deliveries over the next few weeks. The Post Office is working to eliminate these delays as soon as possible.

If you experience any delivery delays in the delivery of your paper, please send your most recent address label directly to the Circulation Manager, Computerworld, 797 Washington St., Newton, Mass., 02160. Upon receipt, CW will initiate Post Office tracing procedures.

RCA Hikes Rental Prices On Spectra, 2d Generation

By Frank Piatto
CW Staff Writer

MARLBORO, Mass. — RCA users leasing either Spectra or any of the company's second generation systems will face rental increases on Aug. 1.

The price increases on the RCA 301, 501, 601 and 3301 will amount to 3%, while those on the Spectra Series will be 5%.

The company's RCA 2, 3, 6 and 7 computers will not be affected by the price increases, RCA said. All currently available peripherals for use with the newer series CPUs will be included in the 5% price increase.

The company further stated that the price boosts will uniformly affect unbundled as well as bundled RCA installations.

The price increases can be interpreted as a strategic attempt by RCA to urge its users away from second and third generation hardware in favor of the newer systems. The RCA 2, 3, 6 and 7 already display a significant price/performance advantage over the Spectras, and the price increase will widen the gap.

The rental hikes with no corresponding increase in purchase price, might also make the systems more attractive to third-party lessors, and encourage leasing customers to purchase systems.

The RCA increase seems surprising in view of the recent announcement of the IBM 360/22, which offers the power of the 360/30 at about one-third the CPU cost.

Manufacturers other than IBM were asked for their reaction to the RCA increases, but all had no comment.

One spokesman, however, noted that the price would feel the impact of the RCA increases since RCA equipment is directly comparable to the 360 series.

"Optimum Computer Usage"

(Continued from Page 1)

clined considerably.

Alips' conference may also stem from the attractiveness for the business user in the technical program, which will include six sessions on "topics of prime interest to business management," the association pointed out.

"Optimum Computer Usage"

(Continued from Page 1)

Chairman of the technical program, Dr. Nathaniel Macon

noted since computers are playing an increasing role in today's economy, "more and more businessmen find themselves in need of increased information relating to the optimum use of EDP systems and personnel."

Other business sessions include:

• Computer acquisition: purchase or lease?

• Computers in transport: for management needs or supplier's benefit?

• The computer professional and the changing job market.

• Competitive evaluation of interactive systems.

• An international view.

Variety of Sessions Flavors Spring Joint

(Continued from Page 1)

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World View

This last session will be chaired by Dr. Carl Hammer, director of Unisys' Research and Development. The session is intended to expose the impact which EDP systems have had upon the sciences, engineering, economy and government of Japan, the UK, the Soviet Union and the U.S.

The conference will actually begin on June 1, with a welcome by Sir John Wall, chairman of International Computers, Ltd., "England's IBM," as keynote speaker.

Worker's Viewpoint

There will be an attempt by a group of unemployed computer workers to counterbalance the emphasis on the employment session, which looks at management's personnel requirements.

The session will look at unemployment from the workers' viewpoint, and is one of five being conducted by Computer People for Peace (CPP) under joint sponsorship with Alips.

The other sessions will include an examination of computer data banks ("the right to be un-listed"), computers as used by the military (the electronic battlefield), minority groups and women in the industry and women in the health systems.

Registration figures were ex-

pected to set a record, Alips

noted.

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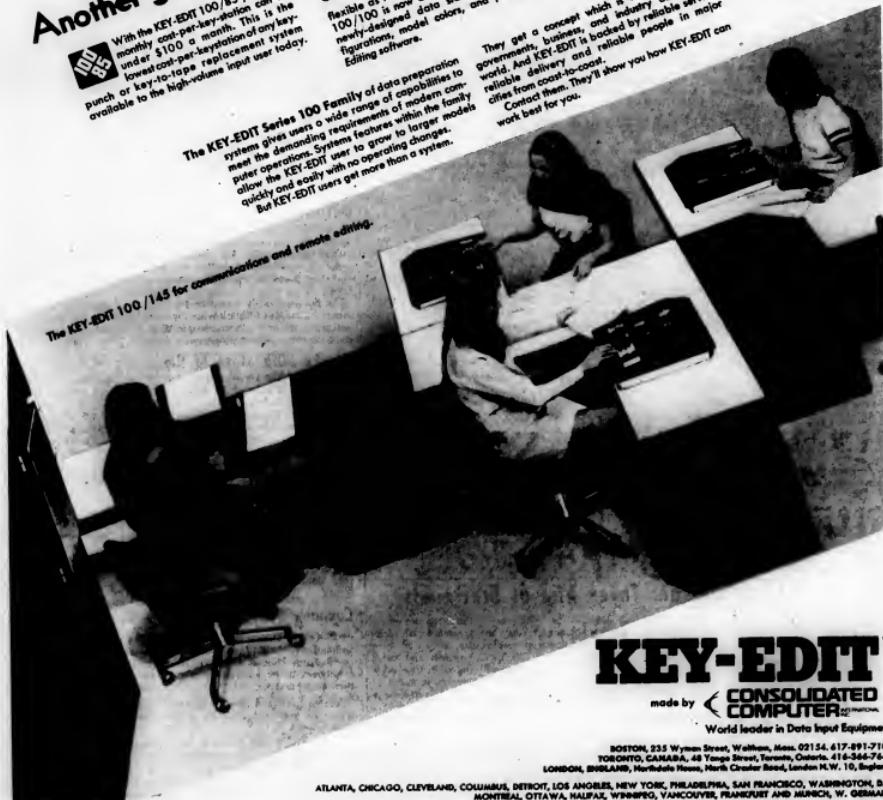
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Rural MD of the Future—Part II**Melting Pot Creates 'Assistant'**

By Thomas J. Morton

CW Midwest Bureau

SALEM, Mo.—A trend is developing in the industry: more successful systems are being brought forth by a cooperative multi-discipline approach.

This is exactly what happened in this tiny Missouri town, and because of it, a rural general practitioner has all the analytical and consultational facilities of a major medical center right in his own office.

A mix of electrical engineers, industrial engineers, physicians, psychologists, commercial artists, systems engineers and systems designers, management consultants, experts from IBM, experts on governmental funding and people from the involved government agencies all got together to help create a prototype system that computerizes a grand old American tradition: the country, family doctor.

With the birth of the idea, named Automated Physician's Assistant (APA), came the realization of all the troubles the mixed team was suddenly facing.

Here was an idea that proposed the use of the very latest in DP technology, hardware and soft-



Dr. B.J. Bass, a rural general practitioner, says that the computer can become as important to the physician as the stethoscope or any of his other tools. (CW photo)

ware, by people who were totally unininitiated in computer technology.

Here was a plan that recommended the installation of DP equipment equivalent to that in the doctor's office already burning its bounds with the equipment of his own profession.

Here was a design that incorporated data transmission through the facilities of three distinctly separate telephone companies.

Here was a system that was expected to be absolutely error-free, because of the kind of vital information it would handle, while it was being operated, a greater part of the time, by people who wouldn't have the vaguest idea of what they were doing.

Not many of those involved gave the idea very good odds on becoming a reality.

But the system is up and running, with the very latest in computer technology, in a crowded doctor's office, connected through three different telephone companies over a distance of over 130 miles.

In a pilot project of the Missouri Regional Medical Program (Mormp), one of the first four such Health, Education and Welfare programs to become operational, the first item on the

agenda, according to Dr. Warren P. Sights of the Mormp operations office, was to find an area that was completely remote from a hospital and second a doctor competent enough to appreciate what the proposed system could offer him and his patients.

"Unfortunately," Sights said, "it is not difficult to find an area without proper medical facilities, even today, but finding that doesn't was somewhat more difficult."

They found both. Salem is a small town of about 4,000 people, deep in the Ozark foothills of the lead mining area of Missouri. "Anyway you want to go," one of the townpeople told CW, "it's a hundred miles or more from town to town (Columbia, St. Louis, or Springfield)."

The doctor was B.J. Bass, a Missourian, but a "newcomer" to Salem (he's been in town for only 15 years) who has been able to win both the confidence and the hearts of his neighbors, and the town itself, on the project, because, he says, he saw what it would do for his patients.

"He wanted it so bad," said Dr. Earl Simmons, executive director of the advanced technology program, "he joined us... on his own time... and fought harder than any of us, I guess, to make sure it got working."

News Wrapup**Detective Sentenced for Selling Data**

NEW YORK — A former police detective was sentenced to 90 days in jail and fined \$5,000 for selling confidential police information — primarily arrest records — to banks and airlines who wanted information on prospective employees.

Includes a copy of a file from New York State's computerized criminal history file. The policeman did not tap the computer directly, but instead stole data from manual files which contained data taken legitimately from the computers.

Michael Martin, a policeman for 24 years, pleaded guilty in January to receiving \$6,590 for the data.

Official Hits Computer Wastage in UK

LONDON — The managing director of a London management consultant firm here believes that computer wastage in the UK may be similar to that in the U.S.

"Our experience in the UK suggests," said R.H. Coleman of the American-based A.T. Kearney firm, "that if we did a similar study here the result would generally coincide with our survey in the U.S. There is undoubtedly a great deal of computer wastage in Britain, he said.

The American survey covered 155 computers used by 89 small, medium and large organizations engaged in commerce and industry.

Of total available machine hours, the average computer in the survey performed productive work only 48% of the time.

Information Processing Journal Published

AMSTERDAM, The Netherlands — The first issue of *Information Processing Letters* will contribute to the exchange of information in this field by the rapid publication of properly referenced, short articles.

The journal aims to allow rapid dissemination of interesting results in the field of information processing in the form of short concise papers not exceeding 2,000 words. These will center around system architecture and application programs and include topics such as theoretical aspects of computer and systems programming and problems of hardware design connected with software production.

One of the features of the journal will be the publication of "Research Reports on Current Work." These will enable readers to learn about projects that are still under way. Another feature will be a monthly issue, will be published in alternate months and six issues will form a volume costing \$25. Free examination copies will be sent on request by Elsevier/North-Holland, Journal Division, P.O. Box 211, Amsterdam, The Netherlands.

British to End Computer-Compiled Phonebooks

LONDON — Bowing to public criticism, the British Post Office has withdrawn computer-compiled phone books which do not list all names alphabetically. The system listed subscribers in alphabetical order up to their surnames and the first letter of their given names, and then listed by alphabetical order of the street on which they lived.

The books, already issued in 14 of Britain's 60 telephone areas, aroused a storm of criticism among users. A Post Office spokesman said no more of the books would be published or issued, and that the computer will be reprogrammed to the old style listing.

Alaska 50th State to Hook Into NCIC Net

ANCHORAGE, Alaska — State troopers here have hooked onto the FBI's National Crime Information Center network making this the fifth state to have access to the network. Information on stolen property and fugitives is stored in a data bank in Washington, D.C. The first time the Alaska hookup was used, a man, stopped on a routine traffic check, was arrested when the computer revealed he was wanted in another state.

House to Consider Results of Brooks Bill

WASHINGTON, D.C. — The House Subcommittee on Government Activities, chaired by Rep. Jack Brooks (D-Tex.), will hold hearings May 19 on the successes and failures of the five-year-old Brooks Bill which established procedures in the Federal Government for the management of automatic data processing.

Witnesses from the Office of Management and Budget, General Services Administration, National Bureau of Standards and voluntary standards people outside the government are expected to testify.

Common Sense Binds IBM's Business Attire

ARMONK, N.Y. — White, buttoned down shirts will not be mandatory for IBM employees, the firm said, in spite of a recent memo from Thomas J. Watson Jr. charging that "too many of our employees are beginning to exceed the bounds of common sense in their business attire."

Colored shirts and modern suits are a threat that "could eventually affect the performance of the corporation in an adverse way," the memo stated.

In addition, Watson called on regional managers to make sure that any employee that "a potential customer might casually observe" was dressed "appropriately."

IBM spokesmen said the memo reflected a "sane position," and that the firm was not instituting any "specific" dress code, unlike many other firms.

Merger Takes Aim at Brownouts

BLOOMFIELD, Conn.—The prevention of electrical blackouts and brownouts is apparently the ultimate purpose of a merger between Dataflight, Inc., an electronics firm based here, and Waters Associates Division of Framingham, Mass.

Dataflight Laboratories, said it planned to use computers in "a new role" in electric power generating stations: extending the life of steam generators and preventing breakdowns and power

shortages by detecting and monitoring the presence of contaminants in the feedwater.

Electronic controls and computers will be used to "automatically achieve closer monitoring and protection," Dataflight's spokesman noted.

The Waters Associates Division has designed and developed equipment for advanced installations, including nuclear plants. Dataflight is a producer of laser beam control and scanning equipment for several fields, including data processing.

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, 277 Washington St., Newton, Mass. 02162.



The Sylvania electronic system enables a patrol officer to transmit and receive descriptive and numerical data on crimes, accidents and other incidents with a video terminal in the squad car. The Sylvania/Digicom 300 system consists of mobile (above) and base station terminals, each of which includes a keyboard for typing messages and a CRT display.

Squad Car Terminal Speeds Police Communications Net

By Edward J. Brice
CW Staff Writer

WASHINGTON, D.C. — A video terminal designed for on-line access to computerized police information has been successfully demonstrated from police squad cars here.

Designed to reduce channel crowding on existing police voice networks, the maker claims the unit can handle 100 data transmissions in the same time for one voice channel.

The unit is just one of a series of portable police-type units developed by GTE Sylvania's Sociosystems Laboratories (SSL) in Mountain View, Calif. Portions of the system have been tested in various police jurisdictions nationwide.

For the three-day metropolitan Washington demonstration, typed messages were simulated



A police dispatcher uses a special keyboard and display console to send and receive pre-coded messages.

to check on wanted persons and stolen cars, and relayed over the voice network in coded tone signals that did not interfere with verbal messages, Sylvania disclosed.

Designated Digicom 300, the unit places the man/machine interface in the squad car, instead of requiring the patrolling policeman to radio his message to a dispatcher, for transmission to one of the several police computer systems (local, state or FBI).

The system consists of mobile and base station terminals, each of which includes a keyboard and a CRT display. After typing the message (up to 64 characters), the dispatcher or patrol officer presses a button to trans-

mit the message in seconds.

The unit also enables the officer to transmit by push-button the status of any unconnected policeman and an emergency alert that he requires assistance.

Digicom 300 communicates directly with minicomputers which act as buffers to the police systems such as the National Crime Information Center (NCIC).

Tested this year, according to Sylvania, a New York test proved the unit could be used "wherever a voice channel is available," including on bridges and in tunnels.

Digicom 300 can be used strictly as a communications extension of police computers, or as a computer-controlled automatic dispatching system known as Respond (Rapid Electronic System for Police Operations and Dispatching).

The overall package has been tested in several areas on both coasts, and was demonstrated for the International Association of Chiefs of Police (IACP) at a convention last year.

Sylvania noted the Respond system, too, is controlled by a minicomputer; all city streets are stored in a disk pack. The system uses a Hewlett-Packard 2115 or 2116, Data General Nova or Tymshare, according to Sylvania, which plans to extend the capability to be conversant with other small computers.

The inclusion of Digicom 300 into Respond "goes a long way toward providing a completely automated dispatch system," according to a company representative.

SSL has developed other minicomputer equipment for police or public usage, such as the Digimap 100 which automatically relays status and location of vehicles to a dispatcher.

The map system is a pressure-sensitive map mounted on a grid-matrix board within "easy reach" of the data terminal station. The unit is connected directly to a Digicom terminal which transmits coordinate data from the digimap to the base station when the operator presses his "location" on the grid.

The semiautomatic system requires less than a second of air-time to relay the data to a dispatcher of the Respond computer, Sylvania reported.



Round-the-Clock Center

Federal Agencies Know Where to Go for DP Service

By Alan Dratell
Contributing Bureau

WASHINGTON, D.C. — A data center that doesn't make any money and thus provides automatic data processing services "cafeteria style" to federal agencies is operating out of a subterranean complex in the Department of Agriculture building here.

Called the Washington Data Processing Center (WDPC) and located two floors beneath street level, the facility is administered by Agriculture's Statistical Reporting Service. It was set up in 1962 and began operations with 16 IBM 360/65.

"We operate 100% under reimbursables; we bill for whatever we provide for our customers," explained Raymond J. Long, WDPC director. And customers include other federal agencies in addition to Agriculture.

Brooks Bill

Under the Brooks Bill, the public law which established the pattern and profile of the Fed-

eral Government's ADP operation, any unused time on federal systems is made available to other agencies. About 25% of WDPC's round-the-clock, seven-days-a-week operation is sold to agencies outside Agriculture.

"We have about \$4.2 million a year in income," said Long. "We have a zero balanced budget, and our prices compare favorably with data centers outside the government. We have to base our rates on cost; this is a requirement of the General Accounting Office."

In most standards, WDPC is a large operation with a staff of 100 operators, programmers, systems analysts, production control people, secretaries, clerks and others.

The facility houses an IBM System 360/65, which it owns outright, and a 65 which it rents.

The 360/65 has 16 tape drives, 1 million bytes of core, two printers, three 2314s, two 2311s, a 2250 CRT and 4 million bytes on a 2301 drum.

The 360/40 has seven tape

drives, 256K core, ten 2311s and a printer. There is transmission control on both computers, and one of the 2314s is shared by both systems.

T8 Terminals

The Model 40 has 40 interactive time-share terminals linked to it — mostly IBM 1050s and Teletypes. The terminals are located in the metropolitan Washington area, two-thirds of them at Agriculture Department facilities and the rest at other federal agencies.

"An average of 35 of the 40 users use the 360/40 every day, five days a week," said Long.

The 360/65 has 16 remote job entry terminals including 10 2780s, Data 1000s, IBM 1130s and 10 and two Unisys 9300s currently being tested.

"We allow our customers to choose any terminal they want so long as it fits into the system."

"Consumer Marketing Services here at Agriculture selected the 9300s, and Unisys is providing the interfacing for the units to



Juan Duley, a summer employee of WDPC, prepares a tape recorded for a computer course. He first learned about DP through a Saturday course for inner city high school students taught by WDPC volunteers. At the console is WDPC employee Anderson Hunt. On the right is another WDPC employee, Otis Williams.

The IBM computer system." CMS chose the 9300s because it needed magnetic tape-oriented memory.

Applications handled by WDPC for the Agriculture Department include crop reporting, the food stamp program, map making, meat inspection and a great deal of data which is fed to the Census Bureau.

Work performed for outside agencies includes a Records Information Movement Study (Rims) for the General Services

Administration and the fiscal year 1972 budget for the Office of Management and Budget.

In addition to its work for Agriculture and outside agencies, WDPC has become involved in a voluntary effort to teach programming to high school students from Washington's inner city. The classes are conducted Saturday mornings and the students receive high school credit. "It's much like a theory course with some hands-on experience," added Long.

State Cracks Down on Computer Dating

LONG ISLAND, N.Y. — The State Assembly, responding to numerous complaints about computer dating received by the Bureau of Consumer Frauds and Protection, set a price ceiling of \$250 and limited the agreement to two years.

Under the measure, the "social referral services" are required to specify a specific number of referrals each month and the buyer is given an option to cancel the contract if he or she does not get the specified number for two or more consecutive months.

If the agreement is cancelled, the client will be entitled to a refund of all monies except the cancellation fee of \$15.

At the termination of the contract, the service is obligated to return all personal information, for

DP May Minimize Gap Between Haves, Have Nots

By Phyllis Huggins
Civ West Coast Bureau

LOS ANGELES — "If we are successful in our mission to bring EDp know-how to developing countries there will be less danger of the have and have-not countries," says Dr. Gerald Estrin of UCLA.

The ability to really level things out will come in a relatively short time. "We do not want the differences between the haves and have-nots to get any worse," Estrin says. EDp, he stresses, can also reduce the danger in the rise of dictatorships. "While EDp does tend to centralize information, at the same time it makes information available to more people."

Estrin is chairman of the Jerusalem Conference on Information Technologies, Tel Aviv, Aug. 16-20.

The results of a two-year study by the United Nations into information processing [CW, April 7] put this technology as the top priority for developing countries, and recommended an international advisory board to aid underdeveloped countries in the use of computers.

"Right now," he said, "they are at the mercy of whoever they meet or whatever manufacturers sell equipment to them. The real power comes when EDp is able to release information that will help equate the world situation. This conference will bring people together for face-to-face help."

EDp technology is essential, he says, for developing countries for three main reasons:

• In order to prepare a problem for the computer — a search-

ing analysis at a deeper level than anything else required is necessary. By its very nature this serves to bring order out of chaos.

In defining problems the country becomes aware of its resources and how to use them.

• By taking workable programs from developed countries, the countries can in one step put the same level of skill and experience in world.

The UN report Secretary-General U Thant also says computers lack the intelligence to compete with human beings but that there are grounds for fearing they may produce a society controlled by technicians.

Estrin suggests that the U.S. form a data processing Peace Corps brought a strong response primarily from managers or directors of DP centers. Some had had experience of one nature, the other in a foreign country. All offered their support to aid underdeveloped countries in the foreign country.

The idea of the DP Peace Corps, according to Estrin, is an excellent one but complicated. The special needs, preparedness and culture gap of the countries involved all have to be considered.

Estrin concurs with Dr. Benjamin Barg, head of the New Technologies Office of the UN, that the UN should serve to help channel talents to the right places. This possibility will be decided at Economic and Social Council's month-long 50th ses-

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Editorial**Are You Being Watched?**

Putting people under surveillance seems to be becoming a national sport.

The latest example brought to our attention involves a bank that has someone copy down the license numbers of cars passing the bank. The license numbers are cross-referenced to the names and addresses of the owners, who, then, receive a letter from the bank that states, "I've noticed you driving by our office on Blank Avenue regularly, and it occurred to me that it might be to your advantage to turn some of your trips past the bank into trips to the bank."

Whether this system is an invasion of privacy we will leave to others to decide. What concerns us is that the bank is making possibly untrue statements over the signature of a branch manager.

Even assuming that the cross-reference from number to owner has been correctly made, the only fact known is that the person's car was observed passing the bank. It is not known that the owner was in it.

Yet the bank is sending out letters personally addressed to the owners which state, "I've noticed you driving by," even though the owner may never have been in it.

It makes you wonder just how often "assumptions" become just plain "facts" by the time they are entered in data banks of personal information.



'That increase Will Do Me a Lot of Good'

Unemployed DP People May Soon Regret 'Good Old Days' of Aerospace Industry

WASHINGTON, D.C. — As a former hand in the aerospace industry, I sympathize with the engineers and computer people who have lost their jobs and who

now find it necessary to reorient their thinking and retrain their skills to get work in other fields. I also sympathize with the aerospace companies who find it necessary to "diversify or perish," as Don L. Williams, president of North American Rockwell Corp.'s Electronics Group, said at a recent meeting in Los Angeles.

There is no doubt that there are those individuals and companies who will benefit from the change easier and faster than others. There will be some, of course, who will not be able to make the transition.

For those who have never been in the aerospace industry, it is difficult to understand what most of the fuss is about.

'The Impossible Mission'

Aerospace people have for years been performing jobs that bordered on the impossible — everything from coming up with sophisticated and highly reliable weapons systems to getting man to the moon and back.

The cost of some of these projects has been astronomical, and the waste abysmal.

Since the major customer was the Federal Government, a general lack of concern regarding expenditures prevailed, despite periodic flurries of what was euphemistically termed "cost reduction" programs.

There was the incident, for example, in which an engineer was carrying a delicate instrument valued at about \$35,000. He accidentally dropped it — and was reported to have shrugged his shoulders at the mess at his feet.

Then there was an application our department was to convert

from a manual operation to a computer. We discussed the conversion at length with the data center, but the project never progressed beyond a year of talking.

A share of the blame for cost overruns goes to the government, too, however. Too often a company would win an award on a particular system only to have federally inspired changes double and triple the original price.

In the hirsute days of aerospace funding, nobody really seemed to care about costs. It was almost traditional to work overtime — whether it was necessary or not. I recall people in our department doing literally nothing all day long, then becoming involved in a flurry of activity a half hour before quitting time so that they could put in two hours of overtime to complete the particular project due the next day.

The companies themselves were culpable. There was little or no supervision to prevent this festering of waste and cost overruns. They bid low to get a project because they knew that the cost overruns would more than make their investment profitable.

In the "good old days," monitoring was perfunctory at best by the government. At its worst, it was ridiculous. There is the case of the government reviewer who was so concerned about good grammar in the technical manuals for the Atlas missile system that he lost sight of whether the information was technically accurate or not.

Or the case of the government which, in a fit of pique, punched holes in negatives of technical manual pages had to be opaque.

The legacy of these atrocious procedures has been that many aerospace companies and aerospace workers have found it quite difficult to convert talents and energies to the commercial market. Things are just done differently there, otherwise the company goes out of business or the worker is fired.

Letters to the Editor

United Farm Workers Needs Keypunching, Programming Help

If you are a keypunch operator or a Cobol programmer, the farm workers need your help.

We are struggling to build a union in a movement. Because we are poor, we cannot afford to hire highly paid experts to help relieve us of the staggering paperwork that a growing union needs. Some data processing professionals have already volunteered and have designed a system for us. We are not attempting to implement it.

To do so, we need experienced keypunch operators who would be willing to donate some of their time and skills either in the area where they live or in Delano, Calif., or Cobol programmers who would be willing to use this project through to completion for a subsistence wage.

If you can help us, please contact me at P.O. Box 130, Delano, Calif., 93215.

Dave Smith

United Farm Workers
Delano, Calif.

Print Run Degradation One-Third

An article by Frank Pinto on OCR devices (CW, March 31) states that an IBM 1287 run under DOS needs at least 33% of memory to do a job.

I think this is highly application dependent since I was involved in an application which involved only 10% of memory, and, in addition, did not require any additional auxiliary storage such as two additional tape drives.

He does note that, according to his user, the print run that is operating concurrently with OCR would come to a virtual standstill. This was not our experience. Our experience was that the print run did suffer some degradation but never over 33%. Most of this was due to contention for a selector channel.

Perhaps this particular user should examine his own uses of his computer as well as what he has running with what in a multiprogramming environment.

Mike Gaal

Peoples Trust Bank
Fort Wayne, Ind.

The article dealt with the difficulties of one user, a large company, and CW that a full print run of 332K bytes of memory had to be reserved for the primary drivers and applications programs required by its OCR procedures.

It is possible that less demanding procedures could result in a decrease in core requirements to the 10K level and that the degradation in print could be kept to 33%. But one-third degradation is a high price to pay in loss of efficiency. Ed.

A Firm Just Flexing Its Muscles?

Unfortunately, it is an accepted fact that most marketing people tend to make exaggerated claims about their product, especially in a new technology market.

Never have I seen this better illustrated than in the article, "Large Storage Unit Field Shows Activity" (CW, April 7), where an Ampex spokesman noted that there was not much competition to its Videofile.

Albert J. Jones
Regional Sales Manager

Mosler Information Systems
Hamilton, Ohio



Shame, IBM, How Could You Use Your Poor Users So?

Next month a lot of IBM 360/25, 30 and 40 users — and not a few 50 ones as well — will have a problem to face. On July 1 Sort/Merge 450, the old warhorse, stops receiving IBM maintenance in accordance with the six-month notice sent out last December.

This means that either the users have now got to start using supported software for their sorts — which is something I would not recommend or alternative, they have to go elsewhere.

And therein lies the rub. Indeed some unkind souls might even suggest that IBM, in removing support for 450 at this time, is precisely what it should do — that its users do go elsewhere — and move up from "free" software to paying for their software by buying the new IBM sort SM1 at nearly \$1,000 a year (\$960 to be precise). If you look at the time of the announcement, it could look like that. SM1 was announced just a year ago, in April, and delivered in June. When this had taken place, so the idea runs, then IBM got on with the job of letting its "free" sort obsolesce so as to get users into the new market.

"Propose SM1..."

To some extent there appears

Letters to the Editor

"Button-Pusher" Speaks

Alan Taylor really hits home with his candid observation regarding standards for computer operators [CW, April 28]. Having worked in my early days as a "button pusher," I can assure you that most operators work under a pressure-cooker environment to get jobs out as fast as they come in. I am sure that many thousands of hours of computer time are wasted each year due to sloppy run procedures.

Unfortunately, many output problems have as their original source the programming and systems area. It is there that because of laxity jobs are submitted for production run with-

to be some basis for suspecting this, if only because of the instructions that IBM salesmen receive about when to sell the paid-for SM1.

"Propose SM1 to your DOS users and to all new prospects," J.F. Manning, vice-president, marketing, wrote to them. No exceptions were suggested — no mention was made of the idea that some users might just as well stay with the sort software that they had been using when they signed up. Just the simple instruction, "Propose SM1..."

But there are other sides to the coin. Performance, for instance, is of paramount importance in sorting. Sort time is still the biggest single user of computer time. Sort times saved in sort routines can be very important.

Moreover, performance is exactly what IBM stresses in its program announcements for "A New DOS Tape and Disk Sort/Merge Program Better Performance" trumpet the heading. Underneath details are given of "Performance Improvements" . . . the performance improvements demonstrated when compared with SM-483 have been:

- 18%-42% for 10K DASD sorts.
- 11%-16% for 22K DASD sorts.
- 6%-9% for 52K DASD sorts.
- 4%-13% for 80K DASD sorts.
- 4%-11% for 116K DASD sorts.
- 13% for 10K sorts.

But NO 450 - SM1 Comparisons All of which is very interesting.

and can be very impressive, but which simply does not directly interest the user of the old Sort/Merge 450 (which is the sort we are considering), nor does it justify that unqualified claim that SM1 "Bettters Performance."

It may better 483 performance . . . but better 450 performance? That's a different story. Manning's letter didn't bring up.

Yet this is the question that users of Sort/Merge 450 must now contemplate. And their answer one way or the other could mean an annual income from SM1 of \$20 million to IBM, which is a figure that can't be ignored.

So the user can reasonably expect to be provided with useful and accurate information.

One way to try to get the real comparison between the 450 Sort and the SM1 is to go back and to look at the claims put forward by IBM in its announcement. There, as in the case of SM1, IBM has provided comparisons with the 483 to SM1 and 450 to 483, perhaps we will be able to make some sense out of the data.

These earlier figures were put out by Manning's predecessor, C.B. Rogers Jr. Interestingly enough, Rogers' letter to his salesmen makes no mention of actual performance comparisons, simply referencing the salesmen to another section for results of comparison runs between the 450 and the earlier 400 and 450 sorts.

Cyrus might explain his reticence by pointing out that the section starts out describing not performance improvements, but performance degradations!

Low Performance Shown

To quote the start of the review:

"Performance . . . Comparison runs with the current DOS/360 Disk and Tape Sort/Merge programs and the new Sort/Merge reflect:

"Performance degradation frequently results when operating in small partition sizes, (10, 22, 52, 80, 116 K). . . . Performance in 10K . . . Some actual test cases run by IBM indicated that execution times for this new sort were the product of the current sort execution times and a performance factor which has the following ranges.

Range Median
23 1.0-2.5 1.6
2400 0.9-1.6 1.4

(Example: A 2400 tape sort

(360-SM-400), which takes 60 minutes, may take between 54 and 90 minutes under the new Sort/Merge."

"Performance in 22K shows degradation for most applications using IBM 2311s as work units or using IBM 2400s on one channel as work units. Actual performance factors ranging from 0.8 to 1.6 with a median at 1.2."

There is more — about performance improvements that were shown when 56K or 120K was used — but that is enough for our purposes.

It adds up to the fact that 450 Sort outperforms 483 substantially at 10K and 22K partitions, and was not outperformed as substantially even when the partition had been raised to 120K.

Now, going back to that 483 to SM1 comparison, you can see that the comparisons when SM1 claimed its great victories of performance were exactly those where the old warhorse, Sort 450, had scored equally substanti-

ally yesterday. In fact, as I see it for users of partitions under 22 — and probably for many up to 56K, the choice that IBM has put before them — and which they have to face in the next few weeks — is:

• Accept a major degradation of performance, by staying on 483.

• Accept the risk of using an unsupported program, by staying on 450.

• Pay IBM \$1,000 a year to keep being supported at current performance levels, by staying on SM1.

And that's not the sort of choice that should be hidden by being split up between a number of documents. Shame on you, IBM, for using such indirect information methods.

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Programming Textbook Called Thorough

By Walter J. Samek

Special to Computerworld

Techniques in Computer Programming, by Philip M. Sherman, McGraw-Hill, Englewood Cliffs, N.J., 1970, 348 pages, \$12.95.

This book explains and illustrates the use of Fortran, but there the similarity with other Fortran texts I have seen ends. The best word to characterize this book is: thoroughness.

Sherman does a fine job of covering various other subjects such as problem analysis, which precedes the actual programming task, and debugging. He provides, moreover, good introductions to some advanced subjects, such as storage allocation and data management.

An imaginary digital computer, the Gamma 70, is introduced and used occasionally to illustrate the use of Assembler Language, or how it relates the operation of the computer to the user. This latter operation, obviously, is an even more advanced one, which the instructor will certainly omit from a beginners' course.

'T/S Design Concepts' Presents Selection Of Techniques Used

By James A. Robb

Special to Computerworld

Timesharing System Design Concepts, by Richard W. Watson, McGraw-Hill Book Co., New York, 1970, 270 pages, \$59.95.

The purpose of this book is to present a selection of the common concepts and techniques which have become apparent in the design and implementation of time-sharing systems.

In the introduction to general-purpose time-sharing systems, several types are presented, along with design requirements and problems. Systematic guidelines provide assistance to those studying the feasibility of time-sharing.

Hardware concepts such as memory, addressing and relocation techniques, communications, protection and control are also covered.

About half of the book deals with software concepts. Since there is no clear separation of functional responsibility between hardware and software, the author has covered some topics such as system protection, memory allocation and control in both parts.

The last chapter effectively covers the need for measurement, reliability, and recovery procedures to be designed into the system.

Frequent summaries are provided to permit the reader to obtain a general understanding of teleprocessing design problems without needing to digest all of the technical details presented. This makes the book useful to those with a limited knowledge of DP as well as a valuable guide to anyone involved in teleprocessing systems design.

James A. Robb is faculty chairman, Vocational Technical Institute, University of Southern Illinois, Carbondale.

'Assemblers, Loaders' Gives General View

By Ned Chapin

Special to Computerworld

Assemblers and Loaders, by D.W. Barron, American Elsevier Inc., New York, 1969, 61 pages, \$4.50.

This very brief book touches upon many topics in compiler writing, but covers no topic in sufficient detail to be useful to compiler writers.

While offering a broad general view and introducing common terminology, it does not, and cannot in its few pages, explain the topics it introduces. It gives the flavor without the substance.

Ned Chapin is an independent consultant in the field of data processing.

Sherman manages to avoid "machine independent" all through the book, never mentioning an actual computer or its manufacturer.

The exposition of Fortran itself is complete and thorough; much space is devoted to those areas which are harder to grasp. I was especially impressed by the separate chapters entitled Input-Output Processes, and Symbol Manipulation. The discussion of string manipulation is a later addition to the book, beyond the limits of ANSI Fortran or any Fortran compiler I am familiar with (although I hear that X3 is working on it).

Snowball is referred to in a footnote, indicating that the student need learn a separate language if he wants to engage in string manipulation. Nonetheless, this chapter will certainly whet the appetite of an alert student.

An excellent book containing much more material than can be taught in one course, this text is suitable for a series of courses.

Walter J. Samek is with Combustion Engineering, Windsor, Conn.

Architecture Includes 'Tricks'

By Oscar Firschein

Special to Computerworld

Computer Architecture, by Caxton C. Foster, Van Nostrand Reinhold, N.Y., 1970, 225 pages, \$12.50.

Intended to teach the art of computer design to graduate students and upper level engineers, undergraduate, the book starts off with a brief review of basic computer architecture, providing background material in a straight-forward manner.

Interest picks up in the fifth chapter, where a case study in depth of the design of the Baus computer is given. From then on, the material is extremely interesting, clearly presented, and includes a large number of "tricks" of the trade.

The latter portion of the book deals with addressing techniques, input/output, and methods of speeding up a computer. Unusual designs involving parallelism and distributed logic, and tessellated computers are given in the last two chapters.

Interesting questions which help clarify the points being made are scattered throughout the text. However, many of the references seem out of date.

The book is also suitable for self-study by programmers having little or no engineering background.

Oscar Firschein is a member of the Information Sciences Laboratory, Lockheed Research, Palo Alto, Calif.

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some of them
but
none of them
have
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COMPUTERWORLD

book reviews

Papers for 1969 Systems Meeting Make Up 'Ideas for Management'

By James A. Robb

Special to Computerworld

Ideas for Management, edited by Association of Systems Management, ASIM, Cleveland, Ohio, 1969, 190 pages, \$10.

This is a compilation of the papers and case histories presented at the 1969 International Systems Meeting held in New York City. Some 28 persons contributed ideas for this publication.

The topics have been organized into five major categories which provide a guide to the ideas presented. The categories are tools and techniques, systems function, management, hardware and communications. Most of the contributions deal with existing problems and procedures but several do have some orientation to the future. Each of the contributors is an outstanding person in his field.

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- No Special Flooring Construction.
- Customer Engineering Staff Always on Call.

Study of IBM Management Information Systems Should Interest 'Old Pros'

By Oscar Finchkin

Special to Computerworld

Computerized Management Information System, by Joseph F. Kelly, The Macmillan Co., New York, 1970, 553 pages, \$10.95.

The author is systems development and program manager for IBM, and the book is IBM all the way. The computerized, indeed, the systems described, the approaches used, and even the final splitting up of the book.

In fact, the book contains so many IBM trees that it is often difficult to see the forest. In many sections of the book, page after page of CRT messages, flow charts and tabulations intrude on the textual material.

The sophisticated reader will enjoy reading about the many quirks of many of IBM's management systems and the techniques for designing them, material that isn't readily available to the non-IBMer. Among the IBM goodies covered are the Order

Entry System, Sales/Marketing Subsystem, Assembly Line Control System, Material Control System, Financial Monitoring System, and Personnel Data System.

The material on the IBM Time Automated Grid (TAG) system's use in system definition, data collection, analysis, and design will be of interest to system designers.

The naive reader who ventures into this thicket of IBM systems may emerge thinking that management systems are synonymous with "IBM."

For such novices, one might have expected that the author would have provided some indication of the components of a computer system and how they interrelate, since a chapter on the history and development of computer components and systems is provided.

The old pro will find much of interest in this book; novices should avoid it unless guidance by an old pro is available.

Managers Can Avoid Pitfalls

By James A. Robb

Special to Computerworld

Administrating and Controlling the Company Data Processing Function, by Leonard T. Kraus, Prentice-Hall, Englewood Cliffs, N.J., 1969, 282 pages, \$19.95.

This book is a must for every data processing manager and executive who has any DP responsibility. The author has carefully selected a considerable volume of management information, refined it with his own experience, and organized it into an effective guide for management action.

The total approach of the text is "planning ahead"; making the correct decision instead of taking corrective action. It identifies some of the most critical areas for management success and suggests ways to avoid pitfalls.

Each chapter deals with a major DP function. The topics range from planning and organizing DP activities through such areas as design, acquisition, staffing, training, conversion, and evaluating the DP facilities.

File Structure, Data Organization Covered

By W.S. Hoffman

Special to Computerworld

Data Structure and Management, by Ivan Flores, Prentice-Hall, Inc., Englewood Cliffs, N.J., 1970, 390 pages, \$13.95.

File structure and information organization techniques, as well as their practical application, are covered in this excellent book. The first seven chapters provide a fundamental introduction to graph theory, simple and linked lists, posting, directories, hash storage techniques and hardware concepts associated with data management.

The remainder of the book consists of practical applications of these techniques using the various IBM OS/360 as the model in each case. For example, use of linked lists is illustrated using the Indexed Sequential Access Method and direct files.

The clarity of illustration far exceeds that of IBM manuals. The complete description of disk pack organization is a typical example. This book deserves to be on the book shelf of anyone developing direct access oriented information systems.

W.S. Hoffman is with the Information Systems Division of E.I. DuPont de Nemours, Inc.

Computer Science Study**Junior College, University OK Degree Plan**

TULSA, Okla. — A cooperative computer science program between Tulsa Junior College and Oral Roberts University will permit TJC two-year graduates

A Reckoning in June

BEVERLY, Mass. — Computers have come to the high school here and are being leased until the end of the school year in June, at which time it is hoped the school committee and board of aldermen can get together on the purchase of computers for municipal as well as school use.

There had been a question of whether the computers should be installed in the junior high schools or at the high school.

to enter ORU as juniors and earn a bachelor of science degree in either mathematics or business administration.

Officials of the two schools expect the program to be in full swing by September 1972 but a few students may begin their work by this September.

This is the first such program between a public and private school of this type, said Oral Roberts, ORU president. He added the program will "strengthen Tulsa's position" as one of the largest computer operation centers in the nation.

Elkins Institute and Southern

Methodist University have re-

cently begun a cooperative pro-

gram to allow transfer of credit

from the vocational school [CW, April 12], while Central Data Institute students will be able to receive credit from the University of Minnesota toward an Associate in Arts or Bachelor's degree [CW, May 5].

Since the program does not have the necessary DP equipment, ORU will not be able to offer a four-year science institute. TJC has 628 students in its computer science program and it is expected that only about a dozen students will enter the program the first year.

Dr. Alfred M. Phillips, TJC president, said the joint effort will allow TJC students to transfer ORU on a full-time and evening basis to work on the final two years of their degree.

**education****Syracuse Program Trains Undergraduate Designers**

SYRACUSE, N.Y. — A program to train undergraduate engineers in the design of computer systems and peripheral devices has been established by the Syracuse University electrical engineering department and will begin accepting students next fall.

Dr. Edward Stabler, one of the professors who will teach the

program, explained it will emphasize computer hardware but will offer enough instruction in programming to familiarize students with this aspect of the field as well.

The four-year program is under the chairmanship of Dr. Wilbur LePage and will lead to bachelor of science degree.

Honeywell to Sponsor DP Camp

NEW YORK — Honeywell will sponsor a scholastic competition to select 20 high school juniors to attend an expense-paid, co-educational summer camp in Wisconsin on computer science.

Winners of the scholarships will be selected from the approximately 1,000 students in 11 states participating in Honeywell's Edinet network. Edinet offers computer-assisted instruction to more than 300 educational institutions and 300,000 students and teachers in California, Georgia, Iowa, Massachusetts, Minnesota, Missouri, New York, Ohio, Virginia and Wisconsin.

Each Edinet secondary school is permitted to enter one student in the competition, and winners will be selected on the basis of designing, implementing and documenting the most original and outstanding computer programs. Programs may be of any type — gaming, business, data processing, scientific, mathematical, administrative, etc.

In order to provide maximum opportunities for individualized instruction, the camp's class size is limited to 10 persons. The first session will be held from July 12-16 and the second from July 17-21.

During the 5-day camp period, students will participate in a 45-hour course entitled "Computer Science Two" and will have additional opportunities to pursue individual computer interests.

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Canadian June DP Conference Cancelled

TORONTO - Poor economic conditions have caused cancellation of the Canadian Data Processing Conference next month, but the Computer Show scheduled by a different society appears healthy.

The DP conference scheduled for June 9-11 will resume as a portion of the Canadian Business Equipment Manufacturers' Association's "highly successful" business show in November.

Conn. S/3 Users Form Group

WESTPORT, Conn. - Increasing computer profitability is one goal of a new group of IBM users who have formed here recently for Connecticut owners/lessors/experts.

Organized by George S. Ahmety - who among other activities deals in used IBM equipment - the group plans to trade programs, provide systems services, evaluate and explore non-IBM peripherals, and facilitate conversions and changes.

Nextime With IBM

Almost as soon as the group would provide test time and 80- to 96-column conversions to members, sell software to non-members and negotiate with IBM for "consistency of services."

The group has a tentative name of Users/Three, and Ahmety reported a "second organizational meeting will be held shortly."

CBEMA has reported.

The DP conference originated as part of CBEMA's Canadian National Business Show, but separation was attempted for the first time after 13 years of combined efforts, the group stated. This year's events is not to be confused with the Canadian Computer Show, Exhibition Park here Sept. 15-17.

The Canadian Information Processing Society reports its Computer Show will be even bigger every day. "Cips predicted attendance would 'grossly exceed' the 15,070 registered visitors at the 1970 Montrealfair event.

The cancelled conference of CBEMA will be absorbed by the

business fair Nov. 15-18, in Montreal. Patrick J. Suddick, president-elect of the association, said the "outstanding seminars and computer exhibits" will be held for management personnel, "which had been planned for the June show, will be moved to the 'combined show.'

He said that, while initial response to the separated show was good, business conditions this year are "not as good" as last year. "The size of such a show, nor could we mount the caliber of show which we have sponsored over the past 13 years."

Suddick said his association might sponsor a separated show in the future, if the "needs of the industry" dictated.

A Mini-Joint by Another Name...

PALO ALTO, Calif. - The successful multi-joint computer conferences (average number of exhibitors-12) have proven so successful that Afips seems to have forced them to change their name. The intimate conferences, sponsored by a few independent companies, have caught on as an effective means for small companies to show their wares.

So effective have they been that Afips, sponsor of the joint computer conferences, received about 500 letters asking for more information on the "minijoins." Afips, "in a friendly fashion," according to President Richard

Tanaka, suggested to the mini-organizers that they were really riding on the joint conferences' coat-tails and they should change their name. Industry sources said it went farther than that, and that the joint conference was threatened with Afips threatening to sue if they didn't change their name.

As a result, the next ex-minijoint (held in Palo Alto on April 22) was called, gulf, the Northern California Computer Invitational Conference.

Decus Observes 10th Anniversary

MAYNARD, Mass. - The tenth anniversary of the Digital Equipment Computer Users Society (Decus) was observed at a special meeting of its board of directors by joint presentations between the presidents of Decus and Digital Equipment Corp.

Kenneth H. Olsen, president of the manufacturing company, presented the user group with a plaque commemorating the society's tenth anniversary, noting its growth over that time to the largest and "most active" computer users' society in the world.

Olsen commented on the impressive growth and activities of the society as he made his presentation recently.

Richard J. McQuillan of Composition Technology, Inc., the president of Decus, presented Olsen with a collection of Decus publications dating from its beginnings to the present, reflecting the growth of the society. Since DEC supports the

society, both officials expressed pride in the progress Decus has made since its beginning.

Decus claims to be the world's most active computer user society, with a membership nearly "double that of the next 12 computer user societies combined."

Formed to permit interchange of ideas between users of Digital Equipment Corp. computers, the society has evolved into a forum for advances in both computer hardware and software development.

The society's 9,000 members in over 40 countries in the free world represent almost all areas of science, medicine, engineering, education and commerce.

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SYSTEM 2400, Data-Converter Configuration

The 2400 turns cards, communications, paper tape, magnetic tape, and keyed data into cards, magnetic tape, paper tape, communications, and printed matter.



Set up as a Data-Converter, the Mohawk Data SYSTEM 2400 can go from any one medium to any medium or mediums your computer prefers. And it can handle any tape density or code in the bargain.

The real bargain, however, is all the things the SYSTEM 2400 can do for you. It will block, unblock, edit, reform, sort and merge all of your processed data. Capable of concurrent I/O operations, the MDS SYSTEM 2400 is also capable of satisfying all your utility needs off-line.

In its standard Data-Converter configuration, the 2400 has a 1250-lpm high speed printer. So you can convert main frame output into usable form without having to spend vast quantities of on-line main frame time. Yet rentals of the 2400 start as low as \$600.

The 2400. It's our new generation of peripheral control, timed to meet the newest generation of computer equipment.

Truly, peripherals have come of age. Mohawk Data 2400.



Mohawk Data Sciences Corp.
Herkimer, New York



May 12, 1971

Page 19

Random Notes**Standard Set for Coding Of Serial Publications**

NEW YORK — Libraries, other organizations concerned with information handling, and subscription agencies can use American National Standard, Identification Code for Serial Publications (Z33.9-1971), to code periodicals, newspapers, reports, yearbooks, and similar publications for cross-referencing and data processing.

Under the standard, an eight-digit code number is to be assigned permanently to each serial publication and the number will be done by the Library of Congress. Costs of the standard are available for \$2.25 from the American at 1430 Broadway, 10018.

COM-700 Software Generates Titles, Indexes for Microfiche

NEWTON, Mass. — "Eye-readable" titles and data indexes can be formatted automatically in microfiche in user-specified data fields, or from fixed constants, with new software capabilities on the Baus Instrument Corp. COM-700 computer output microfilm system.

The new feature is said to be the first self-contained titles and indexes package available for COM users. The Baus COM-700 output is on 18, 35, 70 or 105 mm film, the company said from 20 Ossipee Road, 02184.

Professionals Get Statements, Business Reports From 'Cemis'

PHOENIX — The Client-Employee Management Information System (Cemis) from Western Data Sciences Inc. provides lawyers, accountants, engineers and other professionals with customer statements and reports of business activity and profitability. The package has a lease price of \$3,500 from 5055 N. 12th St., 85014.

'Autotab' Users on GE Network Provided Better File Support

PHOENIX — The Autotab financial planning system, developed by Capex Corp. and available on the GE time-sharing service, has been enhanced to allow users to effectively extract information from almost any data files.

Previously, users were limited to files specially generated by Autotab, Capex said, adding that now users could work with data that is produced by another program. Autotab output can likewise be used as input to other programs, the company said from 2613 N., 3rd St., 85004.

Used Software Worth Money

BOSTON — Users of software may be granted credit toward the purchase of "trade-in" credit toward the lease or purchase of the Cullinane Corp. Cullipr or EDP Auditor packages.

The amount of the credit depends on the original price of the package being replaced and the number of years it has been in use, Cullinane said from One Boston Place, 02108.

AF Sheds 'Lies' on Legal Files

DENVER, Colo. — The search and retrieval facilities of the Legal Information Thru Electronic (LITE) system provide access to a number of data bases including the United States Code, to all Federal, state and local government agencies.

Run by the Air Force at 3800 York St., 80206, LITE charges \$60 per search per data base. The service is unavailable to non-government users.

For Program Development**360 Simulates PDP-11, Varian Minis**

By Don Lewitt

CW Staff Writer

SAN FRANCISCO — Users of DEC PDP-11 or Varian 620/6 minicomputers can develop their programs on an IBM 360 with the Mini-Sim package from Tripe Systems Inc. The package uses a portion of the 360 to simulate the mini so that program assembly and testing can be done more quickly and more cheaply than on the mini, Tripe said.

Assembly and debugging of the mini

programs is faster on the 360 principally because of the faster I/O peripherals on the IBM system. A secondary advantage is that production use of the mini no longer need be disturbed for development, Tripe said.

Assembly is not a substitute for the assembler that is used on the mini itself, Tripe said. The new package provides another environment in which the mini assembler can be used.

Because it is a simulator and not a

cross-assembler, Mini-Sim does not produce programs that must, thereafter, be ressembled on the 360. This is often the case, Tripe said, when a cross-assembler takes advantage of a 360 feature not available on the mini.

Mini-Sim is a software package which allows PDP-11 programs to run on a larger "host" machine. Software which uses the PDP-10 as the host is available from Decus, the DEC users' group.

Programs assembled in the Mini-Sim environment can be debugged on either the 360 or the mini since part of the package provides for simulation of the peripherals as well as the central processing unit of the mini.

After debugging, the program will be ready to run and ready to load on the mini. Later ressemblies to handle program modifications can be run on either the 360 or the mini, Tripe said.

Mini-Sim is priced at \$3,750, including source program, user documentation and sample programs. Delivery is 60 days from 120 Montgomery St., 92104.

Letters Stored on 360 Disk File, Personalized, Printed by 'LWS /2'

WOODLAND HILLS, Calif. — A letter writing system that can produce multiple "eye-readable" copies of up to 255 different letters in the same run, LWS/2 is available from CBIS.

LWS/2 can print in different upper- and lower-case, change side by side and each letter may contain five different inserts in addition to name and address, the company said.

The system provides file maintenance programs for the updating of letters stored on a direct access file. Letters can be added, changed or deleted so that the system can freshen even if sent to the same people two or three times in a row, CBIS said.

LWS/2 prints one- or two-up letters, one- or two-up envelopes and one- to four-up labels. Letter text width may be varied from the common 10 pitch to 12 pitch, 14 pitch, 16 pitch or 18 pitch. Envelopes and label positioning and width are console-controlled variables, when desired.

The CBIS system adjusts entire paragraphs for the varying sizes of inserts, and hyphenates words where necessary. With LWS/2, each printer can produce more than 2,200 letters, runs from 10 to 75 seconds. Envelope and label positioning and width are console-controlled variables, when desired.

The CBIS system adjusts entire paragraphs for the varying sizes of inserts, and hyphenates words where necessary. With LWS/2, each printer can produce more than 2,200 letters, runs from 10 to 75 seconds. Envelope and label positioning and width are console-controlled variables, when desired.

Written in BAL, LWS/2 operates on the

Model 25 and larger 360s. DOS and OS versions are available. The DOS version requires a 24K partition in addition to the disk for the letter file. LWS/2 may be purchased for \$3,500 for the first disk and \$600 for each additional location. CBIS is at Suite 307, 6355 Topanga Blvd., 91364.

Banks, Distributors Get NCR Aid

DAYTON, Ohio — National Cash Register Co. has released separate software packages for production and distribution banking for medium-size commercial banks and order and inventory processing for hard- and soft-goods distributors, using Century series CPUs.

The DDA program is said to provide efficient handling, including account reconciliation processing, for up to 10,000 checking accounts on the Century 2000. A list price program is provided to combine check transactions for selected high-volume accounts along with stop payment and APR.

The distributor's Order Billing Technique II package is a post-billing, batch-oriented system for multi-warehouse operations.

The Order Billing package can be implemented in 16K on the NCR Century 50. The DDA package can also be im-

plemented in 16K of memory but requires the Micro reader/printer that is not available on the Century 50.

Fast, More Compact FMS Added to 'Action/APL' Net

RICHMOND, Va. — The Computer Communications (CC) has developed an enhanced version of the FMS file system which provides bulk storage for APL users external to the workspace. The new version requires approximately 800 fewer bytes in the workspace and operates up to 50% faster than the original FMS, the company said.

The enhanced system is available through the Action/APL time-sharing service, an affiliation of TCC; APL Services Inc., Trenton, N.J.; Computer Innovations, Chicago; and Proprietary Computer Systems, Van Nuys, Calif.

Package Analyzes Execution To Improve Fortran Program

SANTA CLARA, Calif. — Fortran programmers operating under OS/360 should be able to optimize existing programs and develop more effective ones in the future with the Fortran Optimizer (Formax) package from Computer Strategies Inc. (CSI).

Five optional reports are produced to analyze the code activity of the subject program in terms of frequency, time, program activity, subroutine usage and statement type summaries. Optimization is generally accomplished by using the reports to identify those areas of Fortran that account for the majority of the running time.

Formax's optimizer performs a program prior to compilation in order to perform the measurement functions. Code selected for analysis, including I/O statements, is timed by accessing the OS supervisor, to provide the user with actual rather than estimated results, CSI said.

Once the most time-consuming code has been identified, it can often be rewritten with savings of up to 50% in execution time, a spokesman noted.

All execution activity data collected by Formax is reported directly in terms of the user's source language statements, so there is no need to cross-match machine language with an object program listing or linkage editor map.

Formax may require as much as 100K bytes of core during the editor run when the specialized code is added to the source program before compilation.

Once optimized using Formax, the user's programs would be recomplied without the Formax coding before being used for production purposes. It is available for \$7,500, from 283 Brookwood Road, 95050.

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'Roll' Relocates Programs

NEWPORT BEACH, Calif. — A new version of the object language loader for Computer Automation Inc.'s (CAI) Model 116 and 216 minicomputers is said to require only 315 decimal words of memory, and to allow the user to locate his

The Relocatable Object Language Loader (Roll) effectively extends available memory by 150 to 700 words compared to other loaders, the company said. Roll also permits the linking of several individual routines into one single program in memory, even though the routines may have been assembled at different times.

Roll effectively completes the assembly process on the 116 or 216. It uses as input the object language tape generated by CAI's ALC-1, read from the user's source statements. Roll assigns specific addresses to instructions and to data fields, once the program's position in memory has been determined. Series of object language tapes, each representing a separate program, can be loaded consecutively into core by Roll to produce a large single program. This linking of programs is the method used to incorporate the utility subroutines provided by the company, into user programs, CAI said.

Roll is available without cost to current CAI 116 and 216 users from 895 West 16th St., 92601.

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The generalized report writing capabilities of the older test data generator are available on the Pro/Test File Processor, in the basic function of building test data files from user-defined parameters.

With the new package, the output file or report may include a combination of generated and selected records, the company said, to meet the user's exact

COMPUTERWORLD

Data Generator Uses Input File

By Don Levitt

cw staff writer

BURLINGTON, Mass. — The Pro/Test data generator package, with which the user can create files and read from them, has been expanded to allow the reading and selecting of data from an input file as well.

The enhanced package, called the Pro/Test File Processor, is available from Synergistics Corp., and operates on the company's PDA-360 time-sharing system. It can handle 110 files on cards, tape or disk, with the single exception of randomly organized data sets on disk.

With input capabilities, the package can be used for file conversion, correction or reorganization tasks. Generalized input and output can be performed, and the output can be a stripped version of the input, for use in testing programs with real but limited volume data, the firm said.

The generalized report writing capabilities of the older test data generator are available on the Pro/Test File Processor, in the basic function of building test data files from user-defined parameters.

Otherwise, the program can be allowed to run until a program interrupt occurs. At that point, the user is transferred to Cosybug control and may use any of the English-like statements in the command language in order to solve the problem, the firm said.

With the PDA debugging program, users may examine or alter data fields, find the origin of PERFORM instructions and determine the status of each file being processed.

The debugging does not require

The generator and the file selection features are available separately for \$5,500 each. The selection capability is available

to current users of the test data generator for \$2,100. Synergistics Corp. is at One Garfield Circle, 01803.

'Cosybug' Aids Interactive Tests of Cobol Programs

any special source coding in the Cobol program.

The package has been successfully installed on an IBM 360/67 and can be used on any of the 360 time-sharing systems, PDA said. Synergistics Corp., developer, a batch-mode version of Cosybug will be ready two or three months, according to a spokesman.

The package costs \$15,000 from 12 East 86th St., 10028.

Batch Installations Use CCI Business System

ENGLEWOOD, Colo. — Computer Corp. International (CCI) has developed a batch-oriented Management Information and Accounting System (Mias).

Key to Mias is said to be its ability to produce special reports on demand in interactive mode but not disrupting normal processing.

The package generally handles accounts receivables, payables, payroll and other business applications. Written in Fortran IV, Mias costs from \$9,000 to \$30,000 depending on options, from 3375 S. Bannock, 80110.

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AT&T Cuts Private Data Rates

By Don Levitt
CW Technical Writer

WASHINGTON, D.C. — AT&T has apparently decided to expand its long-speed private line services for data users.

A new tariff filed with the Federal Communications Commission would provide Data Line Concentrator equipment at rates one user estimated to be 30% lower than those charged for the same devices under the previously available Data Service.

The Interstate Tariff No. 10A, which became effective in May as part of the FCC's Interstate Tariff No. 260, The revision covers the 10A Data Line Concentrator which allows up to 128 teletypewriters to have low-cost access to a time-sharing computer.

Incompatible Data Sets

The data station lines are grouped into 8, 16 or 32 trunks. The lines and trunks utilize half-duplex facilities capable of transmitting signals at rates up to 150 bit/sec, according to AT&T. Each terminal handled by the 10A concentrator requires a Bell 109 data set, which is incompatible with the standard 103 data set.

As part of the recent AT&T TWX sale to Western Union, Bell has agreed not to provide low-speed data terminals to users on dial-up lines for five years.

PSC Considers Tariff

Rochester Test Can Open Data Lines

By Ronald A. Frank

CW Technical News Editor

ROCHESTER, N.Y. — A proposed testing method that would automatically open a data line has been described by Rochester Telephone Corp.

The testing method is part of the simplified interconnection tariff proposed by Rochester Telephone and suspended by the New York Public Service Commission pending the completion of certain hearings.

As part of the interconnection tariff, Rochester telephone would provide users of noncarrier data sets with a special Network Protective Device (NPD), which is described as similar but less complicated than

the DAA devices now required on Bell System lines.

Rochester Telephone, an independent telephone company, has proposed to supply the NPD device at no cost as part of a new class of service for customer

by Rochester Telephone.

One of the main features of the NPD is a relay that enables the phone company to test a Coam user's line by simply pushing a button on a test board at the central office. Although the user would get no indication of such a test, it would be done only in response to service complaints from the Rochester Telephone officials.

In addition to saving time since a maintenance visit may be avoided, the line testing feature can save the Coam user added costs. In instances where a test is made from the central office, Rochester Telephone proposes a fee of \$3.75. If the user then inspects on a field visit, a fee of \$10 will be charged.

Communications

owned and maintained (Coam) equipment.

The Coam user would be subject to a certification procedure to determine whether his noncarrier data set complies with the NPD and other interconnection criteria. This certification would be accomplished through twice-a-year inspections

Data Briefs

MIS Given OK for Sharing Without Tariff Approval

WASHINGTON, D.C. — The FCC has notified Management Information System Inc. (MIS) that it would have no objection to the company proceeding with the untariffed shared use of facilities leased from communications companies.

A proposed MIS tariff was strongly opposed by the established common carriers, and the commission suggested that it be withdrawn.

ADS Provides Channelling Option on Equalized Modem

IRVINE, Calif. — A channelizing option now available on the ADS-448 Automatically Equalized Modem from American Data Systems provides a capability previously unavailable without a multiplexer.

With the option, the input data channel to the modem can be divided into as many as four separate channels. The data rate per channel (in multiples of 1,200 bit/sec) as long as the total does not exceed 4,800. The basic ADS-448 costs \$6,000. The channelization options range from \$150 to \$750, from 8851 Mission Ave., 94136.

Varian 620 System Can Function As Concentrator, Preprocessor

IRVINE, Calif. — The time-multiplexed Varian 620/DC Data Communications System can serve as a data concentrator, linking a number of low-speed lines to one or more high-speed facilities. It can also be used as a communications preprocessor.

Using Varian 620-88 Communications Controllers and a 620/1 mini, the system can handle up to 128 individual lines with transmission rates from 110 to 4,800 bit/sec. Basic price of the system is \$9,000, from 2722 Michelson Drive, 92664.

Phone Service Studied by WTSC

PITTSBURGH, Pa. — Evaluation, selection, design and analysis of equipment and facilities are provided users under the Telecommunications Services of Western Telephone Co., Tele-Computer Systems Corp. (WTSC).

As part of the service, WTSC consultants study basic telephone and "written-record" systems such as TWX or Telex. They also analyze long-distance costs and usage, special voice and date transmission applications. Cost of the service is based on the user's common carrier billings, WTSC said from 2040 Ardmore Blvd., 15221.

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*For those who missed the October 14, November 25, December 2 and January 27th issues of Computerworld, AMIGOS ("friend" in Spanish) is the data processing industry's most powerful file access method which will completely replace ISAM on the S/360.

May 12, 1971

Bits and Pieces**Remote Job Entry Systems****Use Low-Cost VT1 Reader**

ARCADIA, Calif. — Conversational remote job entry terminals can be configured at relatively low cost by attaching a CT Series punched card reader terminal from Western Telematic Inc. between printing terminal and teleprocessor. The model CTA provides 16, 15 and 10 card reads and puts from 10 to 30 cards with ASCII compatibility for teletypewriter or 30 char/sec terminals. Models CTB and CTC provide 15 or 30 char/sec read rates in Correspondence or EBCDIC code for IBM 2741-type units.

An EIA 5232 dataset connector is used to connect the reader to the keyboard and printer.

Purchase price of the 30 char/sec unit is \$4,175 with leasing available at \$135 to \$148/mo. Delivery is eight to 10 weeks from 5507 Peck Road, 91006.

Small Brokerage Houses Can Use SHBS Mini-Based Turnkey System

MANCHESTER, Conn. — A turnkey system said to eliminate front and back office work problems for small brokerage houses has been installed by Search, Inc., a systems designer. It is built around a DEC PDP-8/L computer.

The Search Brokerage House System (SHBS) automates a variety of tasks including reports for the Securities and Exchange Commission and the National Association of Securities Dealers. It can also prepare specialized sales and business reports.

The SHBS includes the PDP-8/L, printer, memory, disk and tape drives, and source terminals. A typical system can be purchased for \$45,000 or leased for about \$1,000/mo on a five-year plan from 357 E. Center St., 06040.

Off-Line Data Digitizer System Generates 800 bit/in. Mag Tape

STATE COLLEGE, Pa. — An off-line automatic graphic data digitizing system, the GC-3 from Jason, Inc., will accept data from a variety of chart, graph, drawings or drawings and generate an 800 bit/in. magnetic tape. The tape can be annotated with identification blocks through a keyboard and a CRT is available for monitoring the process or playing back tapes. A package in basic Fortran is available. System prices start at \$16,000 and can take 60 days. The company can be reached through P.O. Box 1008, 16601.

User Can Devise Coding Systems For Pnumerated Adhesive Tapes

YORK, Pa. — Pnumerated pressure-sensitive items from York Tape and Label Corp allow users to devise coding and recording systems. Sequence combinations of consecutive and repetitive numbers as well as other copy can be reproduced and perforating and die-cutting combined with printing.

Pnumerated materials in standard formats, the company said, will cost 25% to 75% more than unprinted equivalents. Delivery is usually in about four weeks. The company can be reached at P.O. Box 1309, 17405.

Terminal Maker Reduces Prices

CANOGA PARK, Calif. — Vector General has reduced prices on its interactive Graphics Terminals resulting in cuts of about 10% on a typical graphic system.

9200/9300 Leases Reduced**Univac Doubles 9400 Memory Capacity**

By Frank Plants

CW Staff Writer

BLUE BELL, Pa. — Univac has brought its 9400 model into line with newer medium-scale systems by doubling the amount of available memory.

The company also increased long-term lease discounts on its 9200 and 9300 systems and reduced purchase prices on several peripherals.

The 9400 will be available, Univac said, with memory capacities of 192K bytes and 256K bytes. Previously, the maximum 9400 configuration was 128K bytes.

Of interest to 9400 users is the availability of memory upgrades that can be made in the field. Options include 128K bytes of memory, tape drives, and a one-time charge of \$300 plus the normal rental or purchase cost.

The availability of the 256K byte capacity could forestall defection of 9400 users to such systems as the NCR Century 300 whose memory begins at 128K bytes.

The new model has 128K bytes of 9400 memory with the minimum size of the RCA 2 and RCA 3 models. The increased size of the 9400, together with its cycle time of 600 nsec/2 bytes, makes it competitive with the smaller IBM 370s.

The 64K increment from 128K to 192K, including a third system cabinet, is the same as the 128K to 256K increment from 192K to 256K, will cost \$104,400. The next 64K, to 256K, will cost \$1,500/mo and sell for \$59,100 and includes a fourth cabinet. The complete 192K 9400 processor is priced at \$7,530/mo or \$287,320, while the 256K

processor leases for \$9,030/mo and sells for \$3,644/20.

The changes in pricing of the 9200 and 9300 series affect three- and five-year contracts. The current user with a three-year agreement, however, will not benefit from the new arrangements, and the five-year lessor must have had his lease in effect for at least two years in order to convert to the new Univac rates.

On a level payment agreement, the signer of a three-year lease will get a discount of 15% for early year, while the five-year lessor will get a discount of 25% a year. Previous discounts on a five-year lease were decreased by 15%.

Three-year leases on the 9200 and 9300

were not previously available. Terms under the reducing payment agreement for five-year leases have also been reduced.

Price cuts of 50% on purchase as well as three-year and five-year leases for the 8410 disk cartridge storage system were announced, resulting in a purchase cost of \$6,738.

Cuts of 35% on the purchase prices of the following units were also announced: 1001 card reader/sorter, Fastrand II magnetic drum, Univisro VIII magnetic tape drive and the DCT 2000 data communications terminal. The price of original models of the V11 and V12 keypunches were decreased by 30%.

CRT Series Includes Hard Copy, IBM, Teletype Replacements

MOUNTAIN VIEW, Calif. — A series of eight modular alphanumeric CRT terminals from Photophysics that can replace IBM 2260 and 2265, as well as Teletype 33 and 35 terminals, includes keyboard displays with hard copy output.

The new models are composed of four pairs of units each with similar characteristics, one of which has provision for hard copy.

The hard-copy device uses the company's Quantafax method to produce an image on 5 in. by 4 1/2 in. paper similar to bond, the company said. Black characters are produced with an electrophoretic

toner, and resolution in excess of 10-line pairs per millimeter is claimed.

The initial copy is delivered, the company said, within five seconds, with additional copies produced at two second intervals. Cost per copy is less than one cent, the company said.

The CRTs use a line in, standard TV monitor and differ in number of characters displayed and their compatibility. Character generation is in a 5 by 7 dot matrix, with 7-bit ASCII code. The scan method used is a digital raster.

The 2260 is a desktop solid-state unit with 78 keys providing 64 character, 32 control codes, 17 function keys and 12 editing keys.

The models 20, 40, 44 and 44 all include the hard-copy device but are similar in other ways to the 60, 64, 80 and 84.

The 2260 and 24/64 are compatible with Teletype models ASR 33 and 35. The 2260 has screen capacities of 25 lines of 25 characters while the capacity of the 24/64 is 12 lines of 80 characters.

The 40/80 and 44/84 are compatible with the IBM 2260 and 2265 terminals. The 40/80 has a screen capacity of 25 lines of 40 characters, while the 44/84 screen can contain 12 lines of 80 characters.

Prices of the terminals on a three-year lease including maintenance range from the 20 and 24 at \$305/mo to the 80 and 84 at \$192/mo.

Purchase prices for the terminals range from \$1,000 for the 24 at \$8,000, to the 80 and 84 at \$4,650.

Maintenance is furnished by Honeywell. First shipments are scheduled for July from 1601 Sterlin Road.

System 515 Terminal Can Emulate Univac, IBM and CDC Units

ORANGE, Calif. — The System 515 remote batch terminal from MAM Computer Industries, Inc. can emulate the CDC 2780, the Univac DCT 1004 or the CDC 200.

Software packages allowing the user to change the configuration of the terminal in about 30 seconds are supplied.

Besides a processor, the System 515 includes a 300 card/min reader and a 135 line/min printer. Teletype ASR 33 and a 60 card/min punch are available as options.

The remote batch terminal can be purchased for \$18,800, leased for \$490/mo, including three emulator packages. It will be available in June from 770 N. Main St.

Turnkey System Can Provide Simplest Answer to User Needs

By Frank Plants

CW Staff Writer

With the increasing complexity of programming and lengthening list of available equipment, more and more users are turning to turnkey systems tailored to their particular needs.

Turnkey systems are acquired completely configured with hardware, software and operating instructions to perform the accounting functions for a particular industry, or help physicians keep track of patients.

The list of available turnkey systems is growing daily. One includes systems that do not have the necessary in-house capability, it is to go to outside consultants to do the selection and evaluation of hardware and design and implementation of software.

The turnkey system manufacturer is, in effect, a consultant that can perform both functions. He has selected the hardware that a typical user in a particular industry can buy to best advantage and has adapted this into a system, complete with processor, peripherals, controllers and interfaces.

The turnkey supplier has also designed the software system to allow its adaptation to the individual user's needs with a minimum of effort.

The user of a turnkey system will have to give up some measure of the flexibility that he would have with a system that he had developed from components for the guaranteed reliability and performance of the turnkey system.

The user of the prepackaged system also has a measure more of individuality to the user by supplying him with assemblies and/or compilers and other software.

The user who has a clearly defined problem area in a common industry would probably find it worthwhile to look into a turnkey system and let someone else worry about how to make it work. But unique applications in uncommon industries still require specially configured systems.

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COMPUTERWORLD

Batch Job Processing on Minicomputers May Prove Cheaper Than Time-Sharing

By Frank Piatta
CW Staff Writer

The user who has been utilizing time-sharing systems to do his scientific computing may have an alternative in the form of the large-scale minicomputers.

These systems, primarily the 16-bit word machines, have sufficient computational power, in the form of floating point arithmetic, and large-scale storage with on-line disk systems, to process these jobs on an individual batch basis.

The increasing number of peripherals available for the minicomputers, such as high-speed line printers, tape carousels, and disk drives, make them attractive alternatives to the installation which has the requirements for a large-scale system, such as the 360/44, but insufficient volume to support it.

Software Support

The increasingly sophisticated level of software support available to the minis has resulted in operating systems that allow the user to define his own batch commands and call on files of precompiled subroutines from a disk-resident library.

The installation with a small

number of in-house users can allow each to store his files on the system's disk for ready access. Programs to the data can be afforded by those on time-sharing systems. Bigger installations could dump user files to tape for off-line storage.

Even the business-oriented user

and software packages is said by minicomputer advocates to make them inherently more reliable than the time-sharing systems.

Real-time systems, using interactive methods, however, are still practical for a great number of applications. The infrared remote control for users with small problems to solve is perhaps the ideal. Other cases, where the time required to solve problems is so precious that it outweighs the value of computer time, call for real-time systems.

But for most smaller users, the emergence of the "medium-scale" minicomputer, as DEC refers to its PDP-15, will offer the chance to get rid of a large expensive time-sharing system for a small batch processor at one-third the cost.

Analysis

has not been forgotten, although the major part of the minicomputer continues to be based on the scientific user. RPG that is compatible with IBM 360 can be obtained from several systems houses for the DEC PDP-15, for example. DEC is reportedly investigating the feasibility of issuing such a package itself.

A major shortcoming of the minis, for the most part, is that support for business computation does not extend beyond the software realm. Hardware radix conversion, for example, is not provided, with the user left to make do with the less efficient software conversions.

Simplicity of both hardware

Bits & Pieces

Auxiliary Keyboard Adds Numeric Input

BRENTWOOD, N.Y. — An auxiliary keyboard using a 10-key format, from Eastern Dynamics Corp., is designed to facilitate numeric input to teletypewriter or other ASCII-coded terminals. The unit features a numeric keypad, CR, LF, and Rubout and 10 optional keys to suit user needs. It can be attached to any Teletype model in two minutes, the company said. The KBG/25 is priced at \$295 and is available in 30 days from 158 Suffolk Ave., 11717.

Low-Cost Modular Racks Hold Multiple DP Binders

HOLYoke, Mass. — Compatible with other components in the Data Reference Control System from National Blank Book Co., the Control-Rack 909 is a low-cost anodized aluminum rack to hold data processing binders in multiple configurations. Brackets are provided to permit joining the unit to any two other National floor racks. Priced at approximately \$30, they are available for immediate delivery from Water St., 01040.

Device Shreds Paper Fast

FREESTON, N.Y. — The Bantam-10, a portable, type-size paper shredder from the Shredmaster Corp., can destroy up to 300 lbs of paper per minute. It costs \$200 and is available for immediate delivery from 891 S. Ocean Ave., 11520.

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at using them in on-line systems. We have to be. Many of our clients (computer-sophisticated companies who were in maxis when we met them) are now getting into minis as well.

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CCI Booth Features Communicator, CRT

ATLANTIC CITY — Computer Communications, Inc., of Culver City, Calif., will introduce its new model, the CC-30, a Telcom Model 33 and 35, CRT Display Terminal, CC-70 Computer Communicator, CC-30 Communications stations, and CCI-7000 Communications Processing System.

The Telcom is a portable, self-contained, CRT terminal integrated with Teletype Models 33 and 35. It is designed to replace these units in communications networks without hardware or software changes.

The CC-70 is a high-speed front-end communications con-

trol system that directs the interchange of data between remote terminals and a wide variety of computer systems, relieving the computer of tasks associated with line handling and control, polling, queuing, character and message buffering/disassembly and buffer handling.

The CC-30 is available in both black and white and color models and is intended for use as a low-cost I/O terminal for high-speed on-line access to a computer.

The CCI-7000 (formerly the Telcom T-7000) is an integrated communications processing system that operates as a store and forward message-switching system in a free-standing mode. CCI will be in booth 2537.



CC-70 Communicator

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DOSRELO is a widely accepted utility program which makes the DOS user an application program subroutines in one quick, easy step. DOSRELO reads command output of the program program, and/or object deck/include statements from the System Link File, and dynamically catalogs them to the Core Image Library in their relocatable format (even Release 25 won't do this).

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Singer Shows COM Plotter/Printer

ATLANTIC CITY — Singer Micrographic Systems said that it will display the Model 6020 expandable computer output microfilm plotter-printer. The Model 6020 features a digital controller with 1 usec cycle time, 24 bit word size, 8K word memory, complete operational software and a line of peripherals.

Primarily a line plotter with line-printing and composition capabilities, the Model 6020 converts computer-generated data into alphanumeric characters or graphical plots, which are displayed on the face of an ultra-high-resolution CRT and then recorded on microfilm. The system is said to be well

suited for business graphics, chart, composition of line prints, printer, and engineering scaled drawings.

The Model 6020 features a real-time, general-purpose computer which provides for stand-alone micrographics capabilities. Singer is at booth 1713.



Singer MS-5000/M68020

STC to Exhibit Radial Tape Unit

ATLANTIC CITY — Storage Technology Corp. expects to demonstrate its IBM-compatible ST 3400/3800 Radial Tape Subsystem.

The subsystem features monolithic technologies, read only memory control and programmable maintenance memory.

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Integrated tape switching to allow up to 16 tape drives to be switched between four tape control units.

Tape speeds range from 75 in./sec to 200 in./sec with corresponding data rates from 15 kbit to 320 kbit.

STC is in booth 2307 and 2309.

Sangamo to Display 4,800 bit/sec Modem

ATLANTIC CITY — Sangamo Electric Co. plans to demonstrate its new Sangamodem. The 4,800 bit/sec T4800 is said to offer end users unique modulation and error checking.

The C202CSC OEM modem is designed to provide 1,200 bit/sec capability on a single PC card, with EIA-721 interface and CTCSS. The CTCSS data coupler compatibility. The 300 bit/sec T103CSB is four DDD application via CBT coupler.

Sangamo is at booth 2507.

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Biomation Unveils A/D Recorder

ATLANTIC CITY — Biomation Corp., of Palo Alto, Calif., is slated to introduce the Model 802 transient recorder which utilizes a high-speed, 8-bit analog-to-digital converter with a 1K word MOS shift register memory to capture and hold the digital equivalent of an analog

signal as a function of time.

The 802 can also be used as a high-speed peripheral data-gathering instrument and input buffer memory for a digital computer, the company said.

Biomation will show the 802 at booth 1337.



Biomation 802 in Operation

Lundy Exhibits Graphic Display

ATLANTIC CITY — Lundy Electronics & Systems Inc. expects to introduce system 32, a high performance, computer interactive graphic display system for use with large computers and minicomputers.

System 32's capabilities are



Lundy System 32

SJCC

said to accelerate the decision-making process, where large amounts of complex data are involved. It provides precise, high-speed visual computer output and interaction.

System 32's modular design permits customer selection of specific capabilities and options most suited to his particular requirements.

System 32 ranges in price from \$60,000 to \$100,000 dependent on options, and can be seen at booths 2438 and 2436.

Facit to Demonstrate Small Digital Printer

ATLANTIC CITY — A new digital printer, the Facit 4501, is among the new products and data systems being shown by Facit-Odamer, Inc.

The printer, which will be demonstrated in booths 1943-547, is a highly compact device consisting of a solenoid unit, timing unit and printing unit.

The Facit 4501 operates at 3.5 lines/inch, with a maximum capacity of 20 columns, 12 or 17 char/column.

Facit is also displaying and demonstrating its Series 6000 and 6200 Modular Data Systems for typewriters, adding machines and bookkeeping machines, which simultaneously produce hard copy plus magnetic or punched paper tape.



Facit 4501 Digital Printer

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These characters print with such an exact vertical and horizontal alignment that the BI 1215 can go to a computer, underline or add phonetic symbols. Only an oscillating bar printer with an individual hammer for each column can achieve a printout so exceptional you'd be proud to sign your name to it.



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"Visit Booth 1219 at the SJCC"

I/Onex Data Units Shown in Operation

ATLANTIC CITY — The I/Onex Division of Sonex, Inc. expects data communications equipment to be in operation between a time-shared computer in Philadelphia and its booth at the SJCC.

Products to be shown include the Model 116A time-division multiplexer, Model 31 Data Coupler and Model 41 Data Access Unit.

Odec to Show Line Printers

ATLANTIC CITY — Odec Computer Systems, Inc. plans to exhibit for the first time its models 1321 and 1322 medium-speed line printers.

The 1300 series printers print 132 columns at speeds from 100 to 250 line/min. They offer up to a 96-character set, with individually removable characters. The price of the 1300 series printers is \$4,740 in OEM quantities of 100.

Odec will exhibit at booth 2144.



I/Onex Multiplexer

I/Onex said that the 116A can handle up to 16 data channels over a single, full-duplex, voice-grade line.

Computek Exhibit Features Series 500 CRTs

ATLANTIC CITY — Computek, Inc. plans to exhibit Series 500 low-cost CRT interactive graphics systems, featuring bright-image display, high resolution, with limited display capacity for vectors, points and alphanumeric without flicker and grey scale gradations.

Series 400 graphics terminals, com-

Gould 4800 Prints Alphanumeric, Graphics

ATLANTIC CITY — Gould Inc. will exhibit its Gould 4800 Off-Line Printer/Plotter System in booth 1133.

The system consists of the Gould 4800 Electrostatic Printer/Plotter with either an 8-1/2 in. or 11 in. print width; a 9-track 1/2 in. magnetic tape header; and an interface/control unit. The system produces both alphanumeric and graphics, separately or together.

Standard software includes a character generator package to emulate standard line printer formats. The basic Gould

plotting package facilitates formatting commonly used plotter graphics such as charts, perspective drawings and contours.



Gould 4800 Printer/Plotter

Litton Shows Readers

ATLANTIC CITY — Four readers for punched paper tape, punched cards and edge-punched cards are expected to be shown by Litton Automated Systems, OEM Products.

The Series 1300 Punched Paper Tape and Edge-Punched Card Reader accepts

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tapes up to 1 in. wide and cards up to a fan-fold width of 210 mm and reads them at 200 char/sec, Litton said.

Series 1100 Punched Card and Edge-Punched Card Readers read punched cards at 200 char/sec and edge-punched cards with character-one stop at 175 char/sec.

The firm is at booth 2315-17.

Penril Offers Modems

ATLANTIC CITY — Penril Data Communications plans to exhibit two new modems at booth 1345.

The PDC-4800 B-I data modem is an eight-phase, 4,800 bit/sec modem speci-



Penril PDC-4800 B-I Modem
ideally designed for a full duplex polled system on CS conditioned lines.

The PDC-2000 A is a direct replacement to the Bell 201 A. This four-phase modem offers synchronous operation at 2000 bit/sec over the dial-up network in a half-duplex mode. It is designed to operate with the F 57951, F 58118, CDT, CDR, CBT, 1000 A or the 1001 B Data Access Arrangements.

Inforex Options Include Tape Package, 1401 Printer

ATLANTIC CITY — Inforex, Inc. expects to exhibit its Intelligent Key Entry System in booth 2237.

Optional features to be shown include the 1401 Printer with 132 print positions, operating at a rate of 200 line/min and EXPander.

The basic Intelligent Key Entry System is a multistation, share-processor, data entry system. It permits direct entry of data from up to eight keystations into a central control unit, where data is stored, edited and verified on a disk before being transferred onto magnetic tape for processing in a host computer. Each of the system's stations includes a solid-state keyboard and CRT display mounted on a desk.

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26	Philadelphia
27	Washington, D.C.

DATE	LOCATION
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8	Houston
9	Denver
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15	Seattle
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Bucode Exhibits 3 Tape Drives

ATLANTIC CITY — Three high-performance fully automatic loading magnetic tape systems for OEM, the Models 20291, 20292, and 20293, will be displayed by Bucode, Inc.

The 20291, 20292 and 20293 transport and automatically load high-speed drives that operate at speeds of from 75-120 in./sec., 120-150 and 152-200 in./sec respectively. Available with read/write electronics for 800 bit/in.

NRZI, 1600 bit/in. phase-encoded, and dual (800 bit/in. in.) densities, respectively, they offer transfer rates to 180 kHz, 240 kHz, and 320 kHz respectively.

The company will also demon-

strate its low-speed Model



Bucode Tape Transport

2045. The 2045 offers industry-compatible tape recording at tape speeds to 45 in./sec and packing densities to 800 bit/in. (NRZI) and 1600 bit/in. (P.E.).

The drives will be shown in

booths 2337 and 2339.



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The one with the most peripherals. Over 70 standards. Plus specials.

Codex to Demonstrate Full-Duplex TDMs, 4,800 bit/sec Data Modem

ATLANTIC CITY — Codex Corp. is expected to display operating examples of its main commercial product lines at booth 1153.

The Codex TM-8 is a full duplex Time Division multiplexer designed to serialize multiple independent date speed digital streams for transmission by the Codex AE-96 high-speed date modem.

The Codex 4800 Data Modem, featuring digital and adaptive equalization, is designed to operate at 4800 bit/sec over unconditioned telephone circuits.

The Codex 800 Time Division Multiplexer Series is a character interleaved multiplexer, designed

to meet the demands of data communications systems employing mixed speed asynchronous data rates from 45 to 1,800 bit/sec.

The Codex TM-8 is a full duplex Time Division multiplexer designed to serialize multiple independent date speed digital streams for transmission by the Codex AE-96 high-speed date modem.

The Codex 4800 Data Modem,

featuring digital and adaptive

equalization, is designed to

operate at 4800 bit/sec over unconditioned telephone circuits.

The Codex 800 Time Division



Codex 4800 Modem

Auricord CAS-20's Speeds Variable

ATLANTIC CITY — Auricord Division of Scovil's digital cassette deck, the CAS-20, is expected to be shown in booth 2424.

The CAS-20 is a lower-cost version of the CAS-10 digital cassette deck. Features include single direction read/write from 1.5 in./sec to 15 in./sec with dual direction search from 40 in./sec to 400 in./sec. All speeds

are electrically adjustable.

The CAS-20 has three 1000

hour rated life brushless dc

motors and cassette in-place and

SJCC

file-protect sensors. A high inertia flywheel system is used for rapid damping of tape speed variations.

ISS 715 Stores Up to 58 Mbytes

ATLANTIC CITY — The ISS 715, a 58 Mbyte disk drive with double the storage capacity of conventional units, will be exhibited by Information Storage Systems, Inc.

The ISS 715 offers a storage capacity of 58 million bytes using 406 cylinders on a standard 14 in. disk. The unit will be marketed as an OEM product to computer systems manufacturers.

Information Storage Systems will be in booth 1239.



ISS 715 Disk Drive

WHAT'S AHEAD for the computer industry in the 1970's, as the recession draws to an end?

HOW WILL the mainframe builders fare? The independent peripheral makers? The crowded service and software industry?

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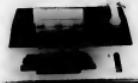
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More than 10,000 mini-computers delivered...

Tracor Presents 1601 Terminal

ATLANTIC CITY — The TDS-1601 conversational terminal, being shown by Tracor Data Systems, Inc., features an impact print-head mechanism which prints a 64-character ASCII subset at 10 or 15 char/sec.



TDS-1601 Terminal

acoustically coupled to a regular telephone handset or hardwired to the appropriate telephone circuit using a Bell System Data Access Arrangement (DAA). TDS will exhibit in booth 1219.

SJCC

A replacement on a plug-for-plug basis for the Model 33 or 35 Teletypewriter, the printer is interfaceable on either a serial EIA standard RS 232B, 20 mA or 60 mA current loop or parallel basis. The TDS-1601 can be

Panasonic Exhibits Static Card Reader

ATLANTIC CITY — A simple, static card reader for Hollerith-coded cards and badges will be introduced by Panasonic at booth 1409. Available in horizontal (CU-TOHC) or vertical (CU-100VC) configurations, the models operate on a low-level light source which activates extremely sensitive, diode-isolated sensors.

The static card reader is available in a range from the standard 10- by 10 Hollerith punches up to 12 by 80. Insertion is manual, and a combined mechanical and electro-optical system prevents improper insertion.

Digitronics Displays Line of Peripherals

ATLANTIC CITY — The complete line of I/O peripheral products manufactured by Digitronics Corp., including perforated tape readers, platen tape readers and mechanical tape readers and handlers, magnetic tape handlers and the new Model 2030 Perforated Tape Reader, will be featured at booth 2117.

With only a single moving part, a single track, the Model 2030 reads at 300 char/sec synchronously, and at 400 char/sec synchronously. It has no pots to adjust and requires no lubrication.

MOHAWK DATA READER MODEL 1101

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Quadri to Show Ferrite, Semi Memories

ATLANTIC CITY — The "Q Core" memory system is to be shown by Quadri Corp. of Phoenix, Ariz.

The "Q Core" storage element, an open-loop ferrite rod, gives high-speed random access. Access time is 75 nsec and total cycle time is 200 nsec, making it comparable in speed to the faster bipolar semiconductor memories.

A series of semiconductor

memory systems, specifically designed to provide an intermix of high speed, standard speed and ROM Memory in one standard Refresh card rack, will also be shown.

Called the "Compatibility," the system consists of the Quadri Model 809-01 Programmable Read/Only Memory, the Model 811-01 Bipolar Read/Write Memory System and the Model 811-02 MOS Read/Write Memory System.

The Model 811-02 MOS Read/Write Memory System is a large capacity, high-speed memory system specifically designed for mainframe memory applications.

The nanoprogrammer, a ROM designed to assist in the evaluation of newly developed micro programs, or other high speed subroutines, contained in hard-wired logic or ROM.

The Quadri Corp. will be at booths 1409-11.



Would you buy it without going inside?

If anybody offers you a price that looks better than ours, you'd better make sure you know exactly what you're getting.

We've just built a low-priced FDM data transmission system that's the best value on the market: the GTE Lenkurt model 25C. Go inside and take a look around...you'll find intermixable speeds from 110 to 600 baud. You'll find a built-in 20 mA local telegraph interface for on-premises printer ap-

plications. You'll find local/remote test features and a built-in carrier alarm lamp. You'll find it meets TTL, S-level and EIA/CCITT interface standards. And you'll find all the quality and precision we've been known for during 25 years of building data transmission systems.

The 25C comes as an attractive single-channel subset. Or the same duplex channel unit can be shelf mounted — up to 8 channels per

shelf with a maximum of 18 channels (110 baud) on each VF line. So it lets you use just one voice channel rather than a lot of data lines. And it lets you do it at a very reasonable price. Add to that the 25C's economy of maintenance and you end up with a bundle of savings.

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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Bendix Launches Datagrid X-Y Plotter System

ATLANTIC CITY — Bendix Computer Graphics, Inc., will be in booth 1213 two Datagrid digitizers, one Microfilm Plotter System and a new Flatbed Plotter/Digitizer.



Bendix Plotter System

Plotter can output finished aperture cards.

The next item in the Bendix booth will be the Datagrid X-Y Plotter/Digitizer. The X-Y Plotter utilizes the measuring capabilities of the Datagrid digitizer.

The system will have input via paper tape reader. The digitizer portion of the plotter will output to an X-Y tape teletypewriter with paper tape punch. This system is ideally suited for interactive design, Bendix said.

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The Datagrid digitizer has been exhibited at previous computer conferences, but this year will be the first public showing of a Datagrid digitizer with magnetic tape recorder and teletypewriter output and input capabilities. Bendix will also exhibit a Datagrid digitizer connected via telephone line to a computer, and this digitizer system will be demonstrating solving engineering problems and design calculations.

The Bendix Microfilm Plotter will be shown with magnetic tape input. Included in the system will be a Bendix minicomputer, and the display scope for previewing data. The Microfilm

EA to Introduce 9 MOS Registers

ATLANTIC CITY — Electronic Arrays is scheduled to introduce nine of its MOS shift registers in silicon-gate technology. The line includes a quad 32-bit register, 1- to 64-bit variable length register, a 256- and 512-bit register — all dynamic; and a dual 100-bit static register.

The registers have the same guaranteed performance characteristics as EA's hermetically sealed registers specified over 0°C to 70°C temperature range, the company said. They will be shown at booths 2643, 44, 45.

Mohawk Labs Exhibits 4000 Random Filing

ATLANTIC CITY — Mohawk Industrial Laboratories, Inc., will exhibit the System 4000.

The System 4000 permits cross-reference selection of information stored in unlimited quantities on tab card-size, randomly filed documents. One document or a group of documents can be retrieved in six seconds. The random filing feature reduces refiling time, eliminates filing errors. The system will be shown at booths 1866, 1868.

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Kybe Shows Tape Cleaners, Testers

ATLANTIC CITY — The Kybe Corp. plans to exhibit its line of tape and disk maintenance equipment.

The Kybe TMS-70 magnetic tape cleaner/tester precision rewinder, a magnetic tape maintenance system, in a table-top unit; the Kybe TMS-200, a magnetic tape certifier designed in price and performance for the computer user; the Kybe TC-10, a low cost magnetic tape cleaner, featuring magnetic tape cleaning and cleaning blade made of an extremely durable man-made sapphire; and the Kybe DP-20, the first auto-

matic disk pack cleaner, a compatible unit for both high and low stacks, will be shown in booths 1186-1188.



Kybe TMS-70

In 5 seconds from your command, a paper copy of your display just like this:



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Delta Data Displays Batchterm Terminals

ATLANTIC CITY — Delta Data Systems Corp. will show Batchterm terminals and Multiterm multiplexers.

Batchterm I, a display terminal with cassette recorder and an impact printer, can work on-line or in a local environment.



Delta Data Terminals

SJCC

ment, allowing information to be prepared locally, and pooled to a computer on an unattended basis.

The impact printer may have various type fonts, and a platen feed. The upper portion of the printer is the display and the impact printer is said to make it useful as an automatic letter writer, or text editing machine.

Multiterm I, a multiple terminal controller, is said to allow 95 devices to use a single phone line. Delta Data will have Teleterm displays and a 165 character impact printer working with Multiterm I, at booth 1139.

The hardware system augments the measurement capabilities provided by Boole & Babbage's line of software measurement tools and is designed to provide DP management with an economical, easy-to-use, yet sophisticated measurement tool to assist in the identification and reduction of computer performance problems.

By applying the concepts of installation calibration and continuous performance monitoring, the Measurement Engine is able to provide the user with timely information with which he can solve computer performance problems.

Boole & Babbage's booth is 1520-22.

Boole & Babbage ME-1011

Wiltek 500 Uses CRT

ATLANTIC CITY — A terminal designed for corporate communications networks will be demonstrated by Wiltek, Inc. The base of the terminal contains two Wiltek Buffer-Stores which allow the terminal to receive data and send or receive at speeds up to 2,400 bit/in, without interrupting data entry.

The terminal is being offered initially



Wiltek 500

with a choice of two data entry devices: the Wiltek 300 employs a Teletype Model 33 KSR with additional character and line delete features. The Wiltek 500 utilizes a CRT with a 2,000-character display and formatting and editing features.

It is priced at \$3,900 and can be seen at booth 1419-1421.

Bridge Offers 8096

ATLANTIC CITY — Two card readers that feed, read and stack the 96-column System card as well as the standard 80-column card and its stub varieties will be featured by Bridge Data Products, Inc. The Model 8096 reads on demand 80-column cards at 300 card/min and 96-column cards at 600 card/min. In OEM quantities it sells for \$1,690.

The Model 8800 reads on demand 80-column cards at 650 card/min and 96-column cards at 1,000 card/min. This medium-speed card reader sells for \$2,500 in OEM quantities.

Bridge Data Products is in booth 1559-1561.

ICC/Milgo Displays Variety of Modems

ATLANTIC CITY — International Communications Corp., subsidiary of Milgo Electronic Corp., plans to feature modems which transmit data over the dial-up telephone network. It is a dedicated line. Included in the ICC display will be Modem 2200/20 which transmits at 2,000 bit/sec; Modem 2200/24 which transmits at 2,400 bit/sec; and Modem 3300/36 at 3,600 bit/sec.

Low-speed modems for OEM use and other high-speed modems for operation up to 1 million bit/sec will be shown in booth 1249.

Viscon Digitizes Graphics

ATLANTIC CITY — Viscon, Inc. is scheduled to exhibit its automatic digitizing system for direct computer input of hand-drawn graphics. The system is used in digitizing all kinds of graphic data including laboratory charts, drawings, maps and photographs.

The heart of the system, the Model GC-3 Automatic Graphic Conversion Terminal, will be exhibited as part of a hardware system which includes a keyboard, a terminal, a digital graphic tape recorder and a visual monitor. Samples of graphic information processed by Viscon's software packages will also be at booth 1979.

Why Wait to Emulate?

With Computer Technology's new DUO/360/370, you can run most DOS object programs under OS right now with no conversion of the object program.

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DOS programs may use STXIT OC, STXIT IT, STXIT PC, CHECKPOINT, the DOS Communication Region, and LUBs and PUBs;

DOS programs may access data sets via the OS data set catalog;

DOS programs may process non-standard

label tapes, or (with no DOS object program change) allow an OS NSL routine to do the processing;

DOS programs may process user standard tape labels;

DOS program execution times can be accounted for by OS SMF.

Sound good?

Then find out all about it.

Call Computer Technology, Inc. at (214) 638-7555. And ask for the Director of Corporate Systems.

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Data 100 to Demonstrate Three Terminals

ATLANTIC CITY — Data 100 plans to demonstrate three products from its Seventy Series of remote terminals.

These include the Model 70 Remote Batch Terminal, Model 73 Interactive Display Terminal, and Model 78 Programmed Terminal.

The Model 70 terminals are plug compatible with the four models of the IBM 2780 Data Transmission Terminal.

The units will be shown at booths 1134, 36, 38.



BI 2600 Synchronous Recorder

Conrac to Introduce Contractor I/O System

ATLANTIC CITY — A product line for OEM applications is slated to be introduced by Conrac Corp.

The Contractor input/output system is a family of physical and logical modules which can be combined in varying groupings to meet both the stand-alone and cluster terminal configurations of most computer systems at low cost.



Conrac 401

The system modules are a video display, a keyboard, a unit controller, a serial distributor and a serial distributor extender.

Conrac will also introduce a new PIX-PAC series of low cost solid-state CRT displays for data applications. Computer-controlled displays, featuring "split-line" displays for large audience viewing, and an extensive array of solid-state, monochrome and color small- and large-screen CRT displays will also be exhibited at booth 1513.

Memory Technology Offers ROM Designed for PDP-8

ATLANTIC CITY — Two Read-Only Memory system products, an MOS ROM series and a PDP-8 minicomputer memory adjust, are scheduled to be introduced at booth 1330-1333.

The MOS ROM complements Memory Technology's line of braid transformer read-only memories and permits customers to work with an MOS memory on a systems basis at a low cost. The MOS systems are compatible with the company's SMS and Nanoram systems.

The ROM, designed for present PDP-8/I and PDP-8/L users, provides up to 32K additional words of storage.

Video Systems to Display CRTs, VS-100 Inventron

ATLANTIC CITY — Video Systems Corp. expects to display its CRT-Data terminals and peripherals including cassette tape recorders and integral modems.

The firm also plans to display its VS-100 Inventron, a self-contained data entry and retrieval system composed of a desk-top video terminal screen with a standard keyboard.

The display is at booth 2301-2303.

The standard unit includes the terminal control unit, 300 card/min card reader, 300 line/min line printer, a choice of EBCDIC, SBT or ANSI line discipline, automatic answer/disconnect, point-to-point and multi-point operation, up to 400 character 7-track buffers and transmission rates of 2,000-3,600 bit/sec.

The units will be shown at booths 1134, 36, 38.

Bright Shows BI 2600

ATLANTIC CITY — A synchronous recorder on display in booth 1219, the new Bright Industries BI 2600 Magnetic Tape Unit, offers a compatible interface, easy operation and reliability.

It features a complex, rigid casting; high-quality guides and geometry; captain encoder control of timing and spacing; a phase-locked captain-servo; and special negator springs that assure uniform tape tension.



Data 100 Model 70

Orbital/1 Processes Documents

ATLANTIC CITY — Orbital Systems, Inc. plans to demonstrate a complete off-line document processing system at booth 1664.

High-speed printed turnaround documents will be scanned by the firm's Orbital/1 System, transmitted to industry-compatible magnetic tape, and then printed out in hard copy form.

Timeplex to Exhibit SMC-200 Multiplexer

ATLANTIC CITY — Timeplex is slated to show its SMC-200 Serial Data Multiplexer, which puts up to 32 channels onto Telpac, TI or microwave transmission facility.

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The device bit interleaves up to 32 synchronous or asynchronous data streams. Input rates of up to 4000 bps/sec may be multiplexed up to group band, Telpac or MILSPEC 1000 channel rates.

SMC-200 may be pyramidized to multiplex hundreds of low-speed synchronous data sources such as start-stop character multiplexers, high-speed printers, CRT terminals, IBM 2780s, etc.

The units will be shown in booth 1664.

a 4800 bps MODEM

and another 4800 bps MODEM



PDC 4800 B



PDC 4800 B1

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It was designed for point-to-point operation over dedicated lines. It does its job better than any competitive unit. It does its job so well that some of our customers are now using it as a dial line modem.

The 4800B1 costs \$2800 and operates in point-to-point and multi-point polled systems.

A unique forward acting equalization scheme permits each drop to be individually and independently equalized to the central site, from the remote site in both data directions.

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SJCC Booth 1345

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K1G 2S1
613-725-8851

European representation by
Barrie Network, Ltd.
28 Greystones Road
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England RG1 1 NW
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Mary Pickett
didn't join ACM
just to save \$30 at
the Spring Joint
Computer
Conference.

But it helped.

Mary Pickett is an associate systems programmer with RCA Computer Systems in Cinnaminson, New Jersey. Not too far from Atlantic City, site of this year's Spring Joint Computer Conference. She joined ACM in 1969, while a student at Purdue. With RCA since last August, she's getting involved in our Delaware Valley Chapter and recently switched from student to regular membership.

She's looking forward to the Spring Joint. "It's a chance to attend good lectures, see the exhibits and renew a lot of friendships," says Mary. "And my ACM membership helps. I save \$30 on admission, more than enough to cover my annual dues."

ACM membership is a lot more than conference discounts. It's technical publications, lectures, seminars and

special interest groups. A chance to get involved. And the professional pride of belonging to the oldest and most respected association in the computer field.

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Potter Peripherals Include Print System

ATLANTIC CITY — The Potter Instrument Co., Inc., plans to demonstrate at booth 1647 its full line of peripherals designed for its user.

One of the highlights will be the DD 4314-1 disk storage drive with an access time of less than 30 msec designed to replace 2314 drives.

The system, consisting of eight drives plus a control unit, will be for \$13,990/mo. Shown for the first time will be the PS 3800 off-line print system.

Printing at speeds up to 1,000 line/min, this low-cost print system relieves the CPU of the printing operation, and thus



DC 5314 Control Unit and DD 4314

increases the CPU's efficiency by increasing available computation time.

The LP 3403 Line Printer operates at 1,500 line/min and is a plug-in replacement for the IBM 1403. It is totally compatible in interface with the IBM 1403, with equal print quality.

Also shown will be the line of magnetic tape units for IBM 360/370.

Potter plans to announce the first of its 6780 Series terminals, replacements for the IBM 2780 Series.

Syner-Data Readies 300 line/min Printer

ATLANTIC CITY — Syner-Data's Alpha line printer, designed for cost compatibility with minicomputers, is expected to be shown. Alpha is a fully buffered 300 line/min, 132-column impact type printer utilizing carbon-interleaved pin-fed paper.

Syner-Data's Beta terminal device, designed to meet increasing requirements

for low-cost hard-copy terminal devices, will also be shown. Beta is a teletypewriter communications terminal capable of operating speeds up to 30 char/sec and a business form line printer for systems not demanding extremely high speed.

Syner-Data products will be shown at booth 1453.

Atlantic Technology Set To Show Display Terminal

ATLANTIC CITY — Atlantic Technology plans to show the ATC 2000 Local Multi Station Data Display Terminal in both 80 and 120 characters.

The system is hardware and software compatible with the IBM 360 and 370. On-line connection can be made at either the multiplexer or selector channels of the computer. Up to 32 displays can be accommodated.

Price of a typical display station including controller is \$140/mo. Purchase prices start just above \$4,000. Delivery is 90 days.



Syner-Data's Alpha Line Printer

Digital Computer Plans Minicomputer Display

ATLANTIC CITY — Digital Computer Controls, Inc., plans to show for the first time two models of the D-112 12-bit and the D-216 16-bit general purpose minicomputer.

The D-112 was introduced last year to give OEMs a "second source" of supply



for general purpose 12-bit minicomputers.

The D-112 is said to be program-compatible with the DEC PDP-8 series.

The D-216 is a microprogrammed solid-state bipolar and read/write memory, which can be mixed with a high-speed core memory.

The D-216 is program-compatible with the DEC PDP-11.

DCC is at booth 1737.

Ultronics Systems Plans Communications Line

ATLANTIC CITY — Data communication equipment planned to be displayed in the Ultronics Systems Corp. at booth 1665-66.

Included will be video terminals in both stand-alone use or in cluster configurations, low- and high-speed data sets and both time and frequency division multiplexers including:

- The Videomaster 7000 Series of video terminals for both stand-alone use in cluster configurations of up to 24 units operating from a single controller.

- The Videomaster Hard-Copy Printer that operates at 30 char/sec, available as an option with Videomaster terminals.

- The four models of Ultronics data pump data sets.

Vogue/Shepard Printer Designed for Mini Needs

ATLANTIC CITY — The Shepard Division of Vogue Instrument Corp. said it will show the 880E, a printer selling for \$7,800 each and designed to meet mini-computer needs.

It interfaces with the DEC PDP-8, Hewlett-Packard 2116, Varian 620 and Honeywell 316 and 516 and the Western Electric 201 and 212 data modems.

Intended for both on-line and off-line applications, the 880E has a full-line 80 character buffer and a speed of 400 line/min at a print line width of 80 characters.

The Shepard Division of Vogue Instrument Corp. is at booth 1154.

Corpak 30 Expands 360/30

ATLANTIC CITY — Information Control Corp. plans to introduce its Corpak 30 add-on memory for 360/30 users.

The Corpak 30 provides the user with 32K or 64K bytes of additional memory for a total of up to 96K bytes.

The company will be in booths 1118 and 1120.

Only TelTerm can recover the rolloffs.

If you've ever experienced top line rolloff, you'll really appreciate TelTerm's exclusive PAGING feature. It puts the rolloffs into memory, instead of into oblivion. And permits recovery at the push of a button. That means you have 3000 characters of display at your fingertips. In any format. Without going into a computer. And that means program preparation with less effort, in less time, and at less cost. Same goes for editing text, or entering inventory, reservations or business form data.

Of course, our other features match those offered by other video terminals, with one big difference: we've put the best of all into TelTerm. Like the most readable upper/lower case character set you can buy. And addressable cursor, blinking, underlining, formatting and line drawing capabilities.

With more too. There's also a long list of useful accessories, such as a light pen, built-in acoustic coupler, hard copy printers, cassette recorders and multiplexers.

End the disappearing data act now. Ask for more information, demonstration, or applications assistance. Or ask about our Delta 1 color display. DELTA DATA SYSTEMS Corporation, Woodhaven Industrial Park, Cornwells Heights, Pa. 19020; telephone (215) 639-9400.

 **Delta Data Systems**
See us at Booth 1130, SJCC

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Atron Terminals IBM-Compatible

ATLANTIC CITY — Atron Corp. plans to show for the first time its set of IBM Model 20 remote job entry terminals.

Designed for 360-compatible communications with IBM, remote job entry, Atron Model 20 replacement terminals offer a reduction in the cost of intelligent, operator-oriented remote

terminal processor systems.

The terminals are equipped with a keyboard/printer supervisory console. Peripheral to the model 20 terminals range from 300- to 1,250-line/min printers and 300- to 1,000-card/min readers.

Atron's terminals will be in booths 1461, 1463 and 1465.



Atron Model 20 Terminals

Calcomp to Show CD 1015/215

ATLANTIC CITY — California Computer Products, Inc. plans to introduce its Model CD 1015 Controller and CD 215 disk drive system.

The new system is plug-to-plug compatible with IBM 360 computers and requires no change in computer system software.

The CD 1015/215 system uses existing IBM 3616 or equivalent



disk packs, but provides 400 information channels per disk surface instead of 200 information channels provided in IBM 2314/2319 systems.

Calcomp will be in booth 2411.

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Plotting System For CDC Terminal

ATLANTIC CITY — Houston Instrument plans to show the BTC-7/200 plotting system for the CDC 204 User terminal. The device is said to be field installable, requiring no modification to the terminal or to the Export software used by a CDC 6000

SJCC

computer for transmission to the terminal.

Housekeeping software available with the BTC-7/200 can be loaded from the terminal and permits plotting speeds up to 300 step/sec, according to the company.

Houston Instrument is at booth 1747.

Diginet Series Has Mixed Speeds

ATLANTIC CITY — The Diginet series of private line multiplexer systems, which permits an interim of channel speeds, is expected to be displayed by GE.

Diginet 160 equipment moves



A.B. Dick Model 9613

Conograph/10 Draws Using Conography

ATLANTIC CITY — The Conographic Corp. plans to demonstrate the Conograph terminal using a revolutionary new approach to producing curvilinear drawings, general purpose graphics, alphanumeric and symbols. Conography, a new technique, uses conic sections to produce any curved contour regardless of its mathematical function.

Conographic Corp. is at booth 2443, 45.

AMP Shows Terminal

ATLANTIC CITY — The latest AMP data entry device will be introduced here. The items include a job cost recording terminal, magnetic card readers, switches and scanners.

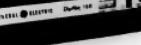
Also being shown are controlled impedance cable assemblies for use in high-speed, low-level circuits, miniature high density connectors, and a line of edge connector for leading packaging.

The company will be at booth 1165.

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data over lease or private four-wire voice-grade lines. In systems where permanent connections are needed between terminals and computer, the mixed speed capability allows users to have a wide variety of terminals within a network, GE said.

The display is in booth 1526-B.

Recording Heads Ready

ATLANTIC CITY — An array of magnetic recording heads and accessories specifically designed for digital applications in computers and peripherals will be exhibited by Nortronics Co., Inc.

The company plans to introduce its new Econs Proposed Standards read-after-write cassette head and will display its line of 1/4 in. and .150 in. minidisk heads, plus its line of 1/2 in. IBM-compatible, 7- and 9-channel heads in booth 2442.



MISSISSIPPI STATE CENTRAL DATA PROCESSING AUTHORITY

IMMEDIATE ADVERTISEMENT for Bids

Sealed proposals will be received by the State Central Data Processing Authority, P.O. Box 100, Jackson, Miss. 39205, on or before 10:00 a.m. (CDT) on May 24, 1971, for the following data processing equipment:

Request for Proposal No. 31 — Lease of a card reader, card punch, envelope inserter, and a 1000 line/min. printer. The unit will be a 1000 line/min. printer with a 1000 line/min. card reader and a 1000 line/min. envelope inserter.

Request for Proposal No. 32 — Lease of a 1000 line/min. card punch.

Request for Proposal No. 33 — Lease of 80 character keyboards, or two 120 character alphanumeric-keyboards. Lease may be obtained from the office of the State Central Data Processing Authority.

Mississippi State Central Data Processing Authority reserves the right to reject any and all bids and proposals and to waive any or all requirements.

Charles L. Guest
Executive Director

Minis Share Equal Load in Jungle and Forest

BUENOS AIRES, Argentina — A computer is helping engineers build a highway in the middle of the Amazon jungle, while halfway around the world the same kind of electronic equipment is distributing timber profits to citizens of a remote Malaysian state.

A Burroughs L 4000 commercial minicomputer is accompanying the bulldozers and road graders of the Brazilian Army Engineering Corps' 8th "Ronson" Battalion to aid construction of a 527-mile segment of highway through the Amazon jungle.

The computer handles inventory for more than 15,000 items used by the project's survey, construction and transportation agencies. The items include vital engineering, maintenance and

medical supplies.

The computer also processes the payrolls for the battalion's military and civilian personnel, involving the preparation of advance payments and benefits, tax and social security deductions, as well as completion of payrolls and addressing of envelopes.

the west-central state of Mato Grosso.

Four Burroughs L 4000 minicomputers are aiding a project by which the government of Sabah, an East Malaysian state north of Borneo, is offering a share in the profits from its April timber harvest to all adult resident citizens.

Cash Dividends

The 3,000-square-mile timber concession provided by the Sabah government is expected to be worth \$5 million to \$7 million, part of which will be passed on to the 10,000 resident citizens in the form of cash dividends, the rest to be used to fund new projects related to timber and other commercial fields.

Scattered across nearly 80% of

its land area, timber is Sabah's major source of wealth. Total timber exports from Sabah in 1970 were worth well over \$100 million.

Registration data on 275,000 residents participating in the program was collected after news of the program had been announced to Sabah's citizenry by village chiefs and district officers. The collected data was fed into the L 4000 in March, and by the end of May, the minicomputers will begin issuing the first trust certificates.

The minicomputers are also being used in administering payroll, general accounting and timber billing. The last application includes complex weight and measurement calculations for which the computational power of the L 4000 system is suited.

CelComp doesn't claim to be driving IBM right out of the business, of course.

But together with our disk drive subsidiary, Century Data, we're claiming a pretty fair share of the market. And a bigger share every month.

Last month, for example, we received orders for more than 300 disk drives.

And while over 90 percent of them will replace compatible IBM devices, we doubt if IBM will replace any of ours. For several reasons.

First, with average access times of 30 to 35 milliseconds, our disk drives are twice as fast as theirs.

Second, with electromagnetic positioning instead of mechanical pawls, detents and gears, ours are simply more reliable.

And third, ours cost less. Ten percent less on a year's lease than IBM's new, low-priced 2319 system, to be exact.

What's more, we've announced a new system of our own, called the CD 1015/12. In addition to being twice as fast as anything IBM delivers, it costs less and stores twice as much per spindle.

CelComp is the leading independent disk drive producer. The first independent to deliver a complete equivalent of IBM's 2314 system, in fact.

So naturally, we plan to produce a plug-to-plug replacement for their 3303 system when it becomes available. On next-generation 370 computers.

Meanwhile, we've got about 40,000 more disk drives on model 360 computers to shoot for.

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For complete information, addresses and phone numbers, please ask for Bulletin No. 130.

CalComp's CD 22/14 replacement for the IBM 2314 system. Each 2-high cabinet stores up to 58 million 8-bit bytes.



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COMPUTER PROTECTION/INSURANCE WORKSHOP

Monday, June 14, 1971, PICK CONGRESS HOTEL—CHICAGO

Produced jointly by the publisher of *BUSINESS INSURANCE* news-magazine and the publisher of *COMPUTERWORLD* newsweekly

Come to the Workshop for ideas.

Come to the Workshop for peace of mind.

For that's what it's all about—ideas to give you peace of mind that comes only from making certain that your computer operation is as risk-free as you can get it.

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you'll enjoy with other Workshop registrants from all parts of the country and in varied types of businesses.

The Workshop is a unique opportunity for you and other executives within your organization who are responsible for the total safety/security/insurance of your computer operation.

Pre-program announcements have also evoked a great deal of interest in the Workshop. Advance registrations from insurance carriers, agents and brokers, and from safety/security suppliers to the computer industry, since the Workshop will give them a much deeper insight into the problems that face corporate management and how those problems are being solved.

Melvin Bockelman

Data processing manager, Kansas City Police Department, on computer operations and invasions of privacy.

Warren G. Brockmeier

Director-western region risk management department, Ebasco Services Inc., on risk management for computer centers.

Karl W. Frucht

Corporate vice president, Household Finance Corp., on physical protection for computer installations.

Fred Zeleny

Chief engineer, western regional office, Factory Insurance Assn., on fire protection for computers.

Rolf H. Jensen

Chairman and professor, fire protection engineering department, Illinois Institute of Technology, on computer fire protection.

Gordon M. Paine

Assistant secretary, St. Paul Fire and Marine Insurance Co., on property insurance for computer facilities.

Louis Scoma, Jr.

President, Data Processing Security, Inc., on security for computer facilities.

Michael Verbick

Manager data processing, Playboy Clubs International, on security and protection for computer records.

Herbert T. Walworth

Manager, special technical services section, Kemper Insurance Co., on protecting computer room employees.

Dr. Robert Wiper

Behavioral psychologist on the care and feeding of computer room employees.

R. C. Bjorklund, T. J. Morton

Moderators, R.C. Bjorklund, editor *Business Insurance*, and T.J. Morton, Midwest bureau chief, Computerworld.

If you have any doubts about the safety/security/insurance of your computer installations . . . if you wake up worrying whether you are fully and properly protected . . . if you want the assurance of comparing your computer risk-management methods with those of other companies . . . and if your mind is wide open to absorbing the latest ideas, techniques and methods of "risk free" computer management—then this one-day workshop is for you!

The registration fee for the full day's program (including a continental breakfast, full lunch, two coffee breaks and a special workshop notebook) is \$105—

with an early registration fee of only \$90. By registering now before June 1, you save \$15. Additional registrations from your company, when submitted together, cost only \$75 each.

If your plans change later on, you are entitled to a full refund (less a \$15 handling charge) if we are notified before June 14. Use the handy coupon below to send in your Advance Registration today. That way you'll avoid the disappointment of an early sell-out, while taking advantage of the substantial discount.

MAIL THIS EARLY REGISTRATION FORM TODAY—SAVE \$15

Mail to: COMPUTER PROTECTION / INSURANCE WORKSHOP
Business Insurance/Computerworld, 740 Rush Street, Chicago, Illinois 60611

Please register the following for your workshop at the Pick Congress Hotel, Chicago, Monday, June 14, 1971:

I am enclosing a total of \$_____ figured at \$90 for the first registration (If postmarked before June 1), otherwise \$105, and \$75 for each additional registration from the same company. Bill me.

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Additional registrants _____

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NOTE:

The registration fee includes a continental breakfast, two coffee breaks, full lunch and a special workshop notebook.

Check here if you want the Pick Congress Hotel to send you room information.



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Tons of gelatine, for table desserts, photographic emulsions and pharmaceutical tablets, are produced each day at Davis Galatine's new extraction facility in Sydney, Australia. The entire process is monitored from this control room by a Digital Equipment Corp. PDP-8/L minicomputer located in the left background.

On-Line Order Entry System Allows New Zip in Emergency Parts Service

By D. Merrill White
Special Correspondent

CAROL STREAM, Ill. — The Allis-Chalmers dealer who needs a replacement part for a customer in a hurry can now command the company's North American parts inventory resources with a single telephone call. The necessary part can be located in seconds, and its availability can be confirmed to the dealer on the telephone.

In minutes, a pick list and shipping documents can be printed at the appropriate stocking depot. Within one hour, an emergency parts order is filled and ready for shipment directly to the dealer regardless of shipping location.

Fast service like this has become a daily routine with Allis-Chalmers' "on-line" emergency parts order entry system. A telephone puts a dealer "on line" with a special operator at the nearest regional parts depot.

A CRT terminal puts the operator "on line" to the IBM 360/40 computer at Parts Central Division headquarters. The computer monitors the current parts inventory balances throughout the network of regional service depots in the U.S. and Canada, and is "on line" to any depot to initiate shipment of required parts instantly.

One-Call Service

The system has made possible direct dealer-computer communications that expedite the emergency order process. The net result: fast, convenient one-call service that provides benefits that can be measured in days of costly equipment downtime, time savings for the dealer's customer.

The system is now fully operative at the "Parts Central" warehouse in Carol Stream, and at six regional parts depots.

The system's significant features include:

- Single source emergency order entry for each of 125,000 parts for equipment manufactured by Allis-Chalmers' powered equipment group — construction machinery, material handling, engine and industrial tractor.
- An inquiry that determines the on-hand inventory status of a single part at a specified depot, total system wide part availability, and also the in-transit part quantity en route to a regional depot.

Immediate confirmation to the dealer of when and where the parts order will be shipped

from and simultaneous update of parts records to reflect up-to-the-minute parts availability at the individual depots and system-wide.

• Versatile dealer control over shipment destination and carrier. The dealer can specify his own, or a customer's shipping address, or the carrier and destination post. The order confirmation flashed on the dealer operator's CRT terminal indicates the shipment's total weight and dollar value. Relayed to the dealer, this information helps him determine the most appropriate shipping method to fit the situation.

In addition to order processing speed and dealer convenience, Parts Central Division management wanted a system versatile if it could handle any emergency order situation. The system had to be able to accommodate footprint computer terminal procedure, yet sophisticated, to detect and screen out inaccurate data.

Finally, it had to be fully compatible with the computer-based inventory management system, involving automatic replenishment of warehouse stocks, along with continual adjustment of inventories to reflect regional demand patterns.

All these goals have been met by the on-line terminal system.

A dealer can place an emergency order entry, receive confirmation of parts availability and record his precise instructions for shipment in as little as three minutes from the time he picks up the phone to call his regional service depot.

Within seconds after the dealer completes his call, the order pick list and the parts to be shipped are printed at a regional depot which will ship the order.

In addition to the IBM 2260 visual display terminals at the depots for handling on-line order transactions, there are also IBM 1053 terminals to reproduce detailed order filling and shipping instructions from the computer.

One of the major benefits of the on-line order entry system is the capability it allows to rapidly adjust the standard parts inventory stock at a regional depot to meet the changing patterns of replacement part demand from dealers and customers served by that depot. In effect, the on-line order entry system constitutes a total depot operation system for emergency parts service.

Mr. D. Merrill White is manager, systems and data processing, for the Parts Central Division of

Allis-Chalmers Manufacturing Co., Carol Stream, Ill.

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Semiconductor Memories Plans RAMs

PHOENIX, Ariz. — The RAM 300 series from Semiconductor Memories, Inc. (Semi) includes 11 memory system configurations, each on a single PC card, ranging from 2K to 4K bits. The RAM 300 has 300 nsec access times and 400 nsec cycle times. Inputs and outputs interface directly with TTL/DTL.

The memories operate from ± 5 V power supplies and are controlled by a single clock. Minimum input "1" voltage is 2V and maximum "0" voltage is 0.8 V. Typical power consumption is as low as 627 μ W/bit. OEM prices in quantities of 100 average 4 cent/bit at the card level.

The Semi fabrication process results in two LSI memory arrays interconnected on an alumina substrate (0.63 in. by 0.63 in.) for a 256-bit memory module and identical sized support module containing all associated support functions on a single LSI chip.

The RAM 300 series includes a variety of standard word configurations and word lengths ranging from the RAM 328A (256 words by 8 bits) to the RAM 389B (1K by 9).

The chip joining process, also known as the

controlled collapse reflow solder system, is based on the IBM-developed Solid Logic Technology (SLT). Each chip is joined to the substrate pin interconnections in a single pass through a reflow furnace.

Microdots I/O Wire-Wrap Tray

SANTA ANA, Calif. — An input/output wire-wrap tray from Microdots Corp. aids in the development of special interface designs for the Micro 400 minicomputer. The tray accommodates up to 232 14-pin I/C sockets, 48 16-pin I/C sockets and 16 24-pin V/C sockets in any combination.

Special designs are wire wrapped on the socket pins. Also included are facilities for the installation of various combinations of discrete components. I/O bus drivers and receivers are included on the board. Six 50-conductor PC connectors provide ample capacity for interface design.

Cost for the tray without sockets is \$200. Each 14- and 16-pin socket costs \$1.50, each 24-pin socket \$3.50, according to Microdots at 644 E. Young St., 92705.

Decision Has 96-Column Reader

JOHNSON CITY, Tenn. — A 300-card/min table-top reader from Decision Data Corp., the 9625, is designed to read the 96-column card.

The 9625-01 includes all read sensing and basic electronics, read checking, 96-column buffer, motor controls, transport and 600 card capacity input and output stackers. The 9625-02 includes

New OEM Products

read sensing circuits, transport, input and output stackers, and casework. List price for the 9625-01 is \$1,200; \$800 for the 9625-02, with OEM quantity discounts available from 300 Jacksonville Road, 18974.

Kratos Unveils CRT Monitor

CANOGA PARK, Calif. — Kratos Display Division's high-speed random position CRT, the 9625, has a writing rate of .75 usec/in. Jump scan times of 6 usec and spot size less than 0.010 in. are included in the Model RM 310.

The display indicator provides a capability of interchanging tube sizes from 5 in. to 24 in. The Model RM 310, available as either a remote indicator, single package, or as a CRT unit, features fast start times and improved brightness. The firm is at 7825 Deering Ave., 91304.

Elec-Trol Has Low-Profile Data Key

SACRAMENTO, Calif. — Low profile data keys developed by Elec-Trol, Inc. are available in 10, 12, and 16 key arrays, as well as custom arrays to exact requirements.

The key incorporates a hermetically sealed reed switch, operating with a moving permanent magnet. The firm is at 26477 N. Golden Valley Road, 91350.

Mostek Heralds 256-bit RAM

CARROLLTON, Tex. — Mostek Corp.'s new 256-bit random access memory, the MK 4007 P, is a pin-for-pin replacement for the Intel 1101/1101. Chief feature of the 4007 is its low power requirement of 250 mW.

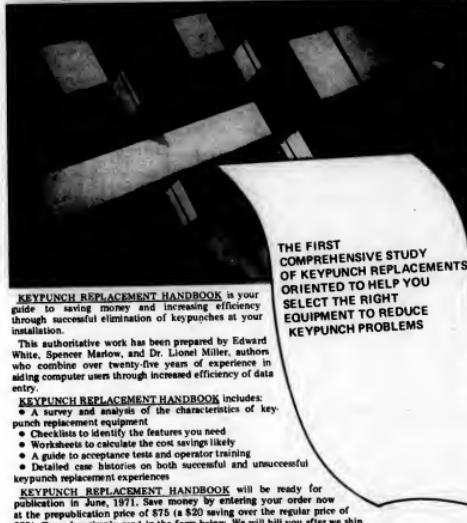
In quantities of 100, the units sell for \$14 from 1400 Upfield Drive, 75006.

Phonocopy Reveals PH400 Modems

STAMFORD, Conn. — Phonocopy, Inc.'s PH4000 series of digital and analog data modems includes the 4000 A (analog version), the PH4000SD (synch digital), the PH 4000 NI (noynch digital), and the PH 4000 AF (4,000 bit, automatically equalized) and the PH 4800 AF (4,800 bit, automatically equalized) will also be included. The modems are designed for the high speed, low cost modem market and are compatible with Western Electric Series 500 hand sets, DAA hard wire for DDS lines or hard wire to leased lines, according to the firm at 120 Long Ridge Road, 06904.

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Keypunch Replacement Handbook



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Mail to: Computerworld, Dept. KRM, 797 Washington St., Newton, Mass. 02160



Clover Stores just opened in February. And already they've eliminated the biggest problems in mass merchandising.

You don't have to be a genius to know what fouls up a retail operation these days:

The mixup with price changes.

And stock outs.

Even things like the long wait at the cash register while a clerk tries to figure out the sales tax from a piece of paper can be the last straw.

Before Clover Stores, Division of Stretwbridge & Clothier, opened on February 25, management figured there must be a better way to run a business. And there is.

The Friden® Modular Date Transaction System (MDTS), the computerized cash register system, and Singer Information Services Company (Sisco) retail application software are in end working for retailers just now.

Clover has 29 MDTS units working in its new store. Each of these cash registers is a terminal to the System Ten Computer. This is the first of 10 stores that Clover will open in the next 5 years. It's one of the first chains built and organized around the computer.

And it's going to make retailing a whole new ball game.

Hardware and know-how

80% of everything you need to know about your business comes through your cash register.

The MDTS captures all that data at its source—while the clerk is ringing up the sale.

There's nothing more for her to do.

And, incredibly, there's nothing more for you

to do. Because of Sisco, the people who provide full information services to the retail industry.

Complete Retail Information Services

At the end of each day's business Sisco polls the Friden System Ten Line Concentrator at the Clover store in Cherry Hill, New Jersey, and transmits the data over voice grade telephone lines to Sisco's third generation, large frame computer at Wayne, New Jersey.

During the night Sisco processes the transaction data through its Sales Audit and Unit Control System and transmits a "Flesh Sales Report" to the Clover headquarters in Philadelphia, Pennsylvania by 8:30 the next morning.

The print-outs provide a complete recap of the previous day's sales by department and classification, cash overage and shortages, audit trail of date transmitted and an edit listing by employee for every register denoting any errors that occurred. The sales file has not been modified, corrections are then transmitted to Sisco's computer at Wayne where the necessary file changes are made and the Audited Sales and Merchandising Reports are transmitted back to Clover headquarters in Philadelphia.

In addition to the traditional sales reports, Sisco's System details item sales by Vendor, Style, Color, Size, Shipment and Fabric. This information is also summarized by Classification and Price Line, thus providing up to the minute unit sales information.

Clover officials claim that the System will help identify and replenish fast moving items.

This total retail information system has the unique characteristic of being virtually error-free. Before the time the sales person presses the 'total' button on the date terminal, the reports are printed out at Clover headquarters, store personnel are not involved.

You're next.

What Friden and Sisco did for Clover Stores, they can do for you.

Because this is the retail computer system that's in and out of the store around the country.

It's not on the drawing boards. It's not "coming soon." It's not a promise. It's a fact.

For complete information on the proven, tested retail information system, write Friden Division, The Singer Company, Sen Leandro, California 94577 or Sisco, 30 Rockefeller Plaza, New York, N.Y. 10020.

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information systems
from SINGER**



Topspin

IBM development technicians borrowed the physical principle of the toy top for an experimental tool to align tape drive capstans — the slotted wheel beneath the top. The alignment block contains two steel ball bearings. When the larger one, at left, is placed in contact with the rotating capstan, it begins to spin like a top when it's started. As the capstan rotates, if the capstan is out of alignment, the friction point between the bearings is shifted off center and the small one rotates.

Rickover Charges

DP Firms Withhold Cost, Pricing Data

CW Washington Bureau

WASHINGTON, D.C. — Vice Adm. H.G. Rickover told the Joint Economic Committee of the Congress recently that computer companies are among those defense contractors who "regularly refuse to provide the cost and pricing data required by the Trade Agreements Act."

He recommended that contractors who refuse to comply "should be ineligible for contract awards just as they are when they do not comply with other federal laws such as the Equal Employment Opportunity Act."

Rickover stated that the Atomic Energy Commission and the General Services Administration "report that the computer

industry as a whole refuses to provide the cost and pricing data required by the law, even though the government buys about \$3 billion worth of computer equipment each year."

Testifying on problems in defense procurement, Rickover, the father of the Polaris Submarine and a well-known critic of the Department of Defense, said that the U.S. is weakened by a procurement system that overall "rewards inefficient contractors."

"Wasteful subcontracting practices, inadequate cost controls, shop loafing and production errors mean little to... contractors since they will make their money whether their prod-

uct is good or bad, whether the price is fair or higher than it should be, whether delivery is on time or late," he charged.

Citing profits, Rickover said that defense contractors "do not have to account to the Department of Defense or to Congress or the public for costs and profits on defense contracts."

"We spend \$3 billion or more every year without knowing how much of that goes for profit," he said.

Rickover also hit out at contractors who "get and keep government-owned tools to perform government and commercial work," expanding their capacity and profit base "without increasing their capital outlay."

Minicomputer Study Sees Market Potential At Over 500,000 Units

PHILADELPHIA — The potential domestic market for minicomputers is well in excess of 500,000 units, according to a new study by the Auerbach Technology Evaluation Service. The study points out that with an installed base of only 21,500 machines at the end of 1970, enormous opportunities exist for future growth in the industry.

While opportunities exist, factors such as price declines of 18% per year, fierce competition and changing technology will place demanding requirements on the participants in the minicomputer market. The study predicts that industrial control applications will continue to be the largest growth area for general purpose devices, which now account for 60% of the total minicomputer system cost, will grow in importance in minicomputer systems.

Line Printer Paper Carbonless, Gummed

ST. PAUL, Minn. — The 3M Co.'s Paper Products Division is offering forms manufacturers two recently improved papers for use with line printers. Carbonless Paper Type 100 and Pronto gummed label paper.

The self-contained carbonless paper, using image chemistry integral to each ply, requires no coating contact to form an image and may be used, the company said, with special originals such as safety paper, Mic and OCR bonds. The resultant blue-purple image can be copied electronically.

Pronto gummed paper has a dry-type adhesive that resists curl caused by moisture and variations in temperature and humidity.

Type 100 is priced at about 5% lower than a comparable coated carbonless paper multiply set. Pronto is competitive in price with other gummed papers, 3M said.

Forms Requirements Eased

WHITE PLAINS, N.Y. — Manufacturers of forms intended to be used with IBM 1287 and 1288 OCR units were recently informed by IBM that the company had relaxed its requirements for paper smoothness, porosity and cleanliness.

The change will come into line with the rest of the industry, simplifying the task of users ordering forms. IBM also informed manufacturers of altered requirements in background ink that were brought about by changes made in the readers.

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Reel-to-Reel Tape Drives Meet User's Needs — Wang

By Dr. Ben C. Wang
Social to Computerworld

The industry-wide rush to lower cost equipment, while it has saved the problem-solver a lot of time and effort — and sometimes it comes in areas where it is least expected. Nowhere is this more true than in off-line mass media storage.

The answer to low-cost tape storage has always been paper tape. The only problem is that the user doesn't like it. The medium itself was unreliable and inflexible enough, but the real problem was the paper tape readers and punches. Noisy and terribly slow, this tape handling equipment was and is continually breaking down.

DP managers, faced by expensive downtime, knew that paper tape was quite costly in the long run and began to cast about for a reasonable alternative.

One of the most promising candidates was the cassette applied to digital recording. It seemed to have all the essential elements. It was reliable, fast, and could be mass-produced, and it was cheap. After all, the cassette revolutionized the audio tape industry; why not the digital tape industry?

For quite a few reasons, as it turned out. To date, the cassette simply does not offer sufficient reliability for most DP applications. Part of the problem is the half-mail Mylar tape which made it extremely difficult to track with the precision necessary. Then, there is the equally severe problem of a lack of control guide mechanisms which results in tape skewing. Further, the low speed (10 to 15 fpi/sec) and low capacity (300 feet) of the cassette make it unsuitable for a large number of DP applications.

Designers have been wrestling with these problems for some time and have yet to

come up with an answer that would give the required reliability, repeatability and flexibility. In fact, the industry has been unable to standardize on one cassette format and there is no early solution in sight.

In an effort to overcome the problems of the medium, tape drive manufacturers have devised ingenious mechanisms to partially compensate for the performance degradation due to the cassettes. Dual spindles and dual reel motors, for example, are used to permit relatively fast start and stop times.

With each compensating mechanism added, however, the cost of this tape handling equipment goes up. Currently, models which use a cassette tape of cassettes cost up to \$1,000, and many of the cassette problems still remain.

This came as a sharp disappointment to the hopeful DP manager, particularly since he knew he'd have to pay another \$1,000 for a polor to perform the serial to parallel conversion necessary to go into an IBM-compatible tape that he could use in his overall system. This, coupled with the industry confusion over standardization, has made most DP users rejet or at least defer for a few years the use of cassette recording equipment in their installations. The innovation intrigues them but not at such a cost to their overall operations.

Reel-to-Reel

Almost unnoticed was another development, not so dramatic as the cassette concept, but much more cost/efficiency. Manufacturers had taken a hard look at reel-to-reel IBM-compatible tape drives and had their designers develop new models which could be priced low enough for the market.

The job required more innovative engi-

neering than it sounds. As recently as last fall, a national magazine columnist reported that "IBM-compatible transports have certain built-in factors which make reasonable performance at quantity prices under \$2,000 per unit difficult to achieve . . . alternate solutions offer the only possibility of significantly reducing transport costs."

Proprietary transports such as this are always dangerous, but seldom has one been proved so wrong so quickly. Already several reel-to-reel, IBM-compatible tape handling systems under \$2,000 are on the market, and one of these is under \$1,500. At these prices, DP managers could afford the performance and flexibility of reel-to-reel IBM-compatible tape systems for all their applications.

From a performance standpoint, of course, high-grade, IBM-compatible tape on a good tape handling system is by far the best tape medium. It permits speeds, capacities and data reliability that simply are not possible with other approaches. The tape handling systems were equally good.

Some models, for example, have such features as a tri-level read threshold for recovering marginal data, variable electronic deskewing to ensure bit alignment during the write operation, and the use of IBM-compatible tape media for maximum interchange with IBM tape systems.

With the new price structure, DP managers stopped waiting for future developments and started buying. It's just not too low acquisition price. That's just the down which lets the customer standardize on IBM-compatible tape and gain performance and flexibility. They work only with repeatable, 9-track parallel tape throughout their DP system. They don't need a polor, so right there they save \$1,000 and preclude a possible loss of

data in the pooling operation.

Define Features

The key was to define the features that a user really needed, eliminate the frills, and then develop innovative mechanization of the necessary features. In this manner, the cost of the drives was brought down without tampering with the tape medium itself.

Such developments are not so romantic as inventing an entirely new medium, but they are no less innovative. Perhaps in the future, the technology of tape cassettes will develop to the point where this medium can meet the features and reliability needed. A number of manufacturers are working in this area, and with that enormous market as an incentive, it shouldn't be too many years away.

Dr. Ben C. Wang is president of Wang Computer Products, Inc. He began his career in the computer tape field at IBM, where he was involved in the development of the first tape unit for the System 360. Subsequently, Dr. Wang initiated XDS's in-house development of peripheral equipment, which resulted in a line of digital tape transports.

Former VIPers Found Firm

WASHINGTON, D.C. — A group of former VIP Systems Corp. employees has formed a new company here called Business Information Systems Inc. VIP, a text editing house, went out of business in March (CW, March 31).

BIS, according to its founders, will develop the AT&T 360 features for the Beloit (Wis.) computer center and will act as the Washington marketing and support office of the Beloit Corp. BIS is also performing systems programming for other customers in the area of teleprocessing and commercial applications.

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Graham 9-Month Earnings Increase 435%

NEW YORK — Just like in the old days, there's a computer company reporting a 435% increase in earnings. This time, though, it's 1971, and the company, Graham Magnetics, has racked up earnings of \$1.02 a share, including a non-recurring gain of 19 cents a share, for the nine months ended March 31.

Net earnings of \$657,102 for three-quarters of the current fiscal year compare with \$128,438, or 19 cents per share, for the same period last year.

The earnings increase resulted from sales of \$5.7 million, a 59% increase over 1970 sales of \$3.6 million for the comparable nine-month period.

Sycor Halves Quarter Loss

ANN ARBOR, Mich. — Terminal maker Sycor, Inc. has reported to investors for the first 9 months of 1971 a million to \$544,000, and tripled revenues for this period from \$568,000 to \$1.7 million.

In the last quarter of 1970, Sycor lost \$640,000.

President Samuel N. Irwin said Sycor "is pleased with the progress being achieved in the U.S. market."

The nine-month figures are even better than the half-year results. In the six months net increased 251% and sales 65% to \$477,642 and \$3.9 million respectively.

Development of a new magnetic particle called "Cobaloy" that is said to increase by more than four times the amount of information that can be placed

per inch on audio and video tape was announced recently. The new particle is also expected to have impact in the digital tape

Financial

market as it allows an increase in bit density from 1,500 bit/in to

20,000 bit/in. Plans for manufacturing and possible licensing of others to make the new particle are now underway, Graham said.

Graham Magnetics now ranks fourth in sales among computer tape manufacturers in the U.S. with approximately 15% of the industry total, according to the company.

Applied Data Trims First Quarter Loss

PRINCETON, N.J. — Helped by a change in amortization procedures, Applied Data Research, Inc. (ADR) has reported a 50% earnings increase for the first quarter ended March 31 of \$1.6 million and a loss of \$145,206 or 15 cents a share.

This compares with operating revenues of \$1.4 million and a net loss of \$266,007 or 32 cents a share for the similar reporting period in 1970.

On Jan. 1, 1971 ADR altered

its accounting policy, extending

the period of amortization of

deferred development costs from

three to five years.

ADR said it believes this change results in a more accurate reflection of the useful life of its

proprietary products, and pro-

vides a more realistic relation-

ship between costs and revenues. The effect of the change is to reduce the net loss for the first quarter of 1971 by \$71,000 or 7 cents a share.

"We have completed a charac-

teristically slow first quarter in a sluggish economy. We are continuing to make a reasonable upturn in sales and expect the year to be profitable," com-

mented ADR's president.

Computer Technology Notes Profit For 3 Months as Revenues Decline

DALLAS — University Computing's facilities management subsidiary, Computer Technology, Inc. (CT) reported a profitable first quarter of 1971 compared with a loss in the like period of 1970.

In 1971's first three months,

CT reported net income of

\$437,000, including an extra-

ordinary item of \$84,000. This

compared with a loss of

\$1,142,000 (12%) in the first

quarter of 1970.

CT is UCC's Dallas-based EDP facilities management organization to users in business and government.

UCC owns 71% and public holders have 29% of the outstanding CT common stock.

Acquisitions

Computer Services Corp. has agreed to acquire Computer Control Corp. for stock and cash both companies are based in Southfield, Mich. Computer Control specializes in municipal and hospital data processing.

The transaction will involve 30,000 shares of Computer Services stock and \$50,000.

Record Retention and Retrieval Corp. (RR), Valley Stream, Long Island, has agreed to purchase Opticom Data

Management Corp., Manhattan, N.Y., for an exchange of 3R common stock. Both firms are microfilm service bureaus.

Tracer Computing Corp. (TCC) has agreed to acquire, for stock, two wholly owned subsidiaries of Bremahan Computer, the Bremahan Data Center, Inc. and Applied Data Sciences, Inc., both of Chicago.

Under the terms of the agreement, TCC will combine its Chicago data center operations with those of the two acquired companies, operating them as a wholly owned subsidiary under the name of Bremahan Data Center, Inc.

Data Science Corp., San Diego, Calif., has been acquired by The Suschman Corp., Alexandria, Va. Data Science will operate as a subsidiary reporting to Suschman's Atlantic Research Division. Data Science manufactures products for the aerospace industry and peripherals.

Computing and Software, Inc. (C&S) has purchased W.R. Simmons & Associates Research, Inc. for an undisclosed amount of cash and notes from National Student Marketing Corp. Simons offers data-base oriented

marketing services.

Time-Sharing Terminals, Inc. has acquired the Computer Terminal Division of Gulton Industries.

Earnings Reports

NATIONAL CASH REGISTER
Three Months Ended March 31

1971 1970

\$br Earnings 8.25 48.39

Revenue 343,000,000 308,000,000

Earnings 5,532,000 6,780,000

a-Rental to include the company's

share of the net earnings of a fully

subsidized basis, c-Adjusted for a fully

subsidized basis.

CONTROL DATA
Three Months Ended March 31

1971 1970

\$br Earnings 5.26 -----

Revenue 141,007,000 \$125,538,000

Per C/Los. 70,000 (\$8,464,000)

Co. (Loss) 12,000 2,000 2,500 4,500

Net 1,037,000 1,221,000

Spec. Cred. 711,000 1,000

Earnings 12,244,000 45,700

a-Related to include the company's

share of the net earnings of a fully

subsidized basis, b-Adjusted for a fully

subsidized basis, c-Adjusted for a fully

subsidized basis.

UNICO
Three Months Ended March 31

1971 1970

\$br Earnings 8.10 9.23

Revenue 4,292,642 4,479,000

Earnings 5,028,000 4,945,000

a-Relating to include the company's

share of the net earnings of a fully

subsidized basis, b-Adjusted for a fully

subsidized basis, c-Adjusted for a fully

subsidized basis.

UNIVAC
Three Months Ended March 31

1971 1970

\$br Earnings 4.48 -----

Revenue 35,342,000 31,334,000

Earnings 5,028,000 4,781,000

a-Relating to include the company's

share of the net earnings of a fully

subsidized basis, b-Adjusted for a fully

subsidized basis, c-Adjusted for a fully

subsidized basis.

DIGITAL EQUIPMENT
Three Months Ended March 31

1971 1970

\$br Earnings 2.23 -----

Revenue 35,342,000 31,334,000

Earnings 5,028,000 4,781,000

a-Relating to include the company's

share of the net earnings of a fully

subsidized basis, b-Adjusted for a fully

subsidized basis, c-Adjusted for a fully

subsidized basis.

TRACOR COMPUTING
Three Months Ended March 31

1971 1970

\$br Earnings 8.01 -----

Revenue 35,342,000 31,334,000

Earnings 5,028,000 4,781,000

a-Relating to include the company's

share of the net earnings of a fully

subsidized basis, b-Adjusted for a fully

subsidized basis, c-Adjusted for a fully

subsidized basis.

ELECTRONIC ASSOCIATES
Three Months Ended April 30

1971 1970

\$br Earnings 6,01 -----

Revenue 35,342,000 31,334,000

Earnings 5,028,000 4,781,000

a-Relating to include the company's

share of the net earnings of a fully

subsidized basis, b-Adjusted for a fully

subsidized basis, c-Adjusted for a fully

subsidized basis.

Nickels and Dimes

MAI shareholders have approved a plan to double the number of authorized common shares and create a new class of \$1 preferred. The recapitalization is part of a project to retire convertible debentures and shore up the financials of the long-ailing company.

SS

From the Inforex annual meeting: From the company is installed "some 250" key entry systems, and production rate is averaging 50 a month.

SS

From the Inforex annual meeting: Prodiced by an abrasive shareholder, Thomas Watson revealed that the Colossus is contemplating adding a woman to the board of directors. One name that came out was Mrs. Patricia Roberts Harris, a black and a former ambassador to Luxembourg.

SS

The board of American Business Products has approved a 3 for 2 split of ABP's common, to be carried out through a 50% stock distribution. The dividend rate for the annual period was \$1.60 per share, up 50% above the 1970 rate, beginning in September.

SS

Ross Perot's capital commitment to Wal Street broker Farnon has gone up from \$30 million to \$40 million. The New York exchange's Board of Governors has agreed to indemnify Perot's group against another \$1.5 million if duPont's losses go over \$40 million. Morton Meyerson, who will become head of the brokerage house if the deal goes through, said that the Texas interests will soon have invested \$20 million in duPont.

SS

And while we're on the subject, here's one that clarifies the Se-Tek has acquired American Computer Service from Cincinnati's American Computer Leasing. The new acquisition provides computer services involving numerical control, and will be marketed by NCD, Inc. March Se-Tek took control of the former Univac metropolitan New York service bureau in Mineola, L.I.

SS

More automation at the Axxess, as plans go forward for a test early in 1972 of a computerized odd-lot trading system. An incoming odd-lot order (under 100 shares) would be identified by the exchange computer and filled in memory. As soon as a round lot order was executed in the issue, the odd-lot order would be retrieved, executed by the computer, confirmed with the originating broker, and reported to the specialist in the stock. The specialist would handle only market orders, those calling for purchase or sale as soon as possible at the market price.

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